



Izembek

National Wildlife Refuge

Land Exchange/Road Corridor

Final Environmental Impact Statement

Chapter 2 Alternatives





U.S. Fish and Wildlife Service Mission Statement

The Mission of the U.S. Fish & Wildlife Service is working with others to conserve, protect and enhance fish, wildlife, plants and their habitats for the continuing benefit of the American people.



Refuge System Mission Statement

The Mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

—National Wildlife Refuge System Improvement Act of 1997

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2.0 ALTERNATIVES

2.1 Introduction

Chapter 2 describes the process of developing alternatives for the Izembek National Wildlife Refuge Land Exchange/Road Corridor Environmental Impact Statement (EIS). The chapter includes the alternatives carried forward for detailed evaluation, including 2 alternatives that address the proposed action, 2 additional action alternatives, and the No Action alternative; mitigation measures; and other alternatives considered and eliminated from detailed analysis. The alternative development process complies with the requirements as stated in the Council on Environmental Quality *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (NEPA).

The following information is included in this chapter:

- A discussion of how alternatives were developed;
- Descriptions of alternatives considered but dismissed from further analysis;
- Descriptions of alternatives considered in detail, including the No Action alternative;
- A discussion of mitigation measures, best management practices, and associated monitoring practices that would eliminate or lessen adverse environmental impacts by alternative;
- A summary comparison of the effects of the alternatives (a detailed assessment of effects is given in Chapter 4); and
- Identification of incomplete and unavailable information and an examination of the impact of these data limitations on the environmental consequences analysis.

2.2 Alternative Development Process

A stepwise approach was taken to develop and assess action alternatives that would meet the project purpose and needs as described in Chapter 1. The first step developed a range of alternatives that address the project purpose and need, including the issues and alternative proposals identified during the scoping process, and also comply with federal, Tribal, state, and local regulations. Alternatives carried forward for detailed consideration were guided by the key legislative directives, the *Omnibus Public Land Management Act of 2009* (Act) and NEPA.

Key points of the Act and NEPA, relative to alternative development, are summarized in this section; other applicable laws and regulations are summarized in Chapter 1. The steps in the alternative screening process are also summarized in this section.

The Omnibus Public Land Management Act of 2009

- The Act directs the Secretary of Interior to prepare an EIS that will analyze the impacts of a proposed land exchange with the State of Alaska and the King Cove Corporation for the purpose of construction and operation of a road between the communities of King Cove and Cold Bay, Alaska.

- The Act requires the analysis of at least 1 road alternative (single lane, gravel) that is developed in consultation with the State of Alaska, the City of King Cove, and the Agdaagux Tribe of King Cove.
- The Act specifies several elements to minimize adverse impacts of the road corridor on adjacent refuge lands, including a cable barrier on each side of the road, unless a different barrier type is required by the Record of Decision for the EIS; transferring the minimum acreage of federal land required for the construction of a road corridor; and incorporating roads that are in existence. Mitigation elements identified in the Act include the avoidance of wildlife impacts and mitigation of wetland loss, and the development of an enforceable mitigation plan.

National Environmental Policy Act of 1969

- NEPA requires documentation of the alternative development process, including alternatives considered but dismissed from further analysis.
- NEPA requires the analysis of a No Action alternative, the proposed action, and a reasonable range of alternatives to address the purpose and need for the proposed action.
- The No Action alternative is considered a description of existing conditions. As such it introduces no new impacts. However, if the lead agency was to take no action, and other parties would predictably take action, then those predictable actions are cumulative effects of the No Action alternative.

2.2.1 Step 1: Development of Range of Alternatives

The Service and cooperating agencies identified the potential modes of transit between the communities of King Cove and Cold Bay to be considered for inclusion in project alternatives. Modes of transit that were outside the jurisdiction of the lead agency were also considered. This step did not include specific alignments and/or routes; it was focused only on general modes of transit.

General modes of transit were evaluated in this step because of the large number of potential alternatives and variations for implementation within each mode. Thus, this step was intended to develop a basis for a reasonable range of alternatives, in accordance with NEPA, rather than a large number of specific alternatives for transit between the communities of King Cove and Cold Bay, Alaska. The modes of transit were identified by the Act, the scoping process, review of the King Cove Access Project EIS (2003 EIS) (USACE 2003), and recommendations by the cooperating agencies.

In conjunction with a proposed land exchange, the Act calls for the analysis of a single lane gravel road; this therefore requires the analysis of the road/motor vehicle mode of transit. In addition to the road/motor vehicle mode of transit, comments received during scoping identified alternative modes of transit that would not involve a land exchange for the purpose of constructing a road. Additional modes of transit identified through scoping included:

Hovercraft: Transit from the Northeast Terminal to Cross Wind Cove;

Marine transit: Ferry, private fishing vessels, building a harbor in Cold Bay, improvements to the Cold Bay dock;

Rail transit: Narrow gauge railway or light rail; and

Air transit: Helicopter evacuation, United States (U.S.) Coast Guard (Coast Guard) evacuation, improvements to the King Cove Airport to improve aircraft use, given weather and topographic limitations, and use of seaplanes.

While not a mode of transit, an upgrade to the existing medical facilities in the City of King Cove was also suggested as an alternative during scoping, and was incorporated in the screening process.

2.2.2 Step 2: Development of Screening Criteria

The Service and cooperating agencies developed screening criteria that were used throughout the alternative development process. The project purpose was the basis for the development of the screening criteria. The framework for the process was guided by NEPA and the Act. Each of the criteria identified had equal weight during the screening process. The screening criteria included both qualitative and quantitative elements.

2.2.2.1 Screening Criteria Based on Purpose and Need

The development of screening criteria for use in the alternative development process was based on the project purpose and need, which is defined in Chapter 1 (Sections 1.3 and 1.4). In general terms, the purpose of the proposed land exchange is to allow the construction, operation, and maintenance of a single lane gravel road between the City of King Cove and the Cold Bay Airport. The needs include reliable and safe transportation for medical emergencies and evacuations, quality of life, and cost effective transportation that is relatively simple to operate and maintain. Based on these needs, the following screening criteria were identified:

Reliability of transportation: Estimates of the number of days per year that a particular transit mode can operate, considering weather and mechanical cancellations.

Capacity to operate 24 hours per day: Daylight hours and other operations factors (excluding weather) can limit some modes of transit from operating 24 hours per day. This criterion had a yes or no evaluation.

Same day connection with other transit modes: Some modes of transit may not enable same day connections with outbound transportation to medical care or out of region travel, while others have high reliability for connectivity. This criterion had a yes, no, or maybe evaluation.

Travel time between the communities of King Cove and Cold Bay: Standard travel time assumptions were created for each mode carried forward to the screening matrix. Waiting times (such as airport check-in or boarding) were not considered; time was estimated for each mode of travel only, primarily in the context of a medical evacuation.

Specialized equipment or trained personnel required for transit mode operation and maintenance: For the construction and/or operation of the different modes of transit, some would require more specialized equipment or trained personnel. Modes were compared qualitatively using this criterion; the ease of obtaining trained personnel in a rural community was also considered (e.g., snow plow operator vs. helicopter pilot).

Cost to user: The estimated cost a person would pay to use each mode of transit one-way, between the communities of Cold Bay and King Cove. The cost estimates were for routine transportation, not emergency evacuation.

Construction costs: Estimated new, one-time costs to construct each mode of transit. The estimate included the cost of design and permitting.

Operating and maintenance costs: The estimated cost of operating and maintaining the mode of transit for 1 year and for the 35-year project life.

2.2.2.2 Other Considerations

The Act included requirements to minimize impacts to the refuge, including wildlife and wetlands. The Izembek Wilderness is a key refuge resource. Additional considerations were identified, reflecting requirements of the Act to minimize impacts to the refuge. These resource concerns influenced the development of the design of each alternative.

Wildlife, fish, plants, habitats, subsistence resource impacts: Siting and/or alignment of potential modes of transit were designed to minimize impacts to wildlife, fish, plants, habitats, and subsistence resources.

Wetlands and waters of the U.S.: Siting and/or alignment of potential modes of transit were designed to minimize impacts to wetlands and waters of the U.S.

Wilderness acreage: Potential changes in acreages of congressionally designated wilderness were considered in the design of potential modes of transit, including alternatives that would not site modes of transit in congressionally designated wilderness.

Wilderness character impacts: Potential changes in the character of congressionally designated wilderness were considered in the siting and/or alignment of potential modes of transit, including potential changes to wilderness character induced by modes of transit sited outside of wilderness. Changes in characteristics such as naturalness, undeveloped quality, untrammelled quality, and opportunities for solitude were considered.

2.2.2.3 Criteria Dismissed

As the screening process progressed, criteria definitions were refined and several criteria initially included were dismissed due to lack of applicable local statistics to provide a valid comparison, redundancy with other criteria, or the topics would be more appropriately addressed in the analysis of impacts in Chapter 4. The following criteria were dismissed, for the reasons noted:

Delays: This criterion focused on the capacity to accommodate reliable and timely medical evacuations. However, any mode of transit can incur delays, and local data was not available for comparison. The concept was considered to be included in the reliability of transportation criterion.

Life cycle costs: This criterion addressed the construction cost in the year the alternative is placed in service, added to annualized operating and maintenance costs. Annualized operating and maintenance costs are operating costs for all future years converted to present value, based on a 35-year life and 4 percent interest rate (FHWA 2002; ADEED 1999). These cost components were captured in construction, operation, and maintenance cost criteria.

Availability of emergency and specialized services for health care: While health and safety is a key element of the purpose and need of the project, this criterion was considered to be encompassed in the reliability of transportation criterion.

Location entirely within Izembek National Wildlife Refuge: None of the alternatives would be located entirely within the Izembek National Wildlife Refuge, so other federal, state, and private lands could be involved in each alternative. The project must comply with the terms of the Act, and so this criterion did not differentiate among alternatives.

Relative function and values of habitat associated with exchanges: This factor attempted to focus on wildlife species' use of land exchange parcels. However, it was recommended for inclusion as a topic of analysis for each alternative in Chapter 4, rather than as a screening criterion in the development of alternatives.

Subsistence management; primarily subsistence opportunities foregone: This factor attempted to focus on potential impacts to subsistence. However, it was recommended for inclusion in Chapter 4, with analysis by alternative.

Fulfilling laws/regulations/agency missions/Executive Orders: The Service and cooperating agencies are required to uphold applicable laws and regulations for any alternative considered. The development of screening criteria was also guided by the legislative directives of compliance with the Act and NEPA, so this factor did not serve to screen among alternatives.

Safety of transit mode: The objective of this criterion was to evaluate the potential of each mode of transit to minimize human and wildlife mortality. However, reliable local statistics were not available and national statistics were not considered to be readily applicable to local conditions.

Acres of inholdings: The exchange parcels are constant through all road alternatives, and so this factor did not served to distinguish among alternatives. Where inholdings might have differential impacts on the affected lands, the wilderness impacts criterion captures the concerns.

2.2.3 Step 3: Mode of Transit Screening

The screening criteria and the identified modes of transit were discussed and evaluated by the Service and the cooperating agencies. Background data, applicable to each of the specific modes of transit, were gathered for each criterion to facilitate the screening process and evaluate potential modes of transit.

The modes of transit were screened by going through each criterion and assigning a rating, depending on whether the mode would or would not fulfill that criterion, and therefore address purpose and need elements. Evaluations were made at a coarse scale. Rationale for dismissal is discussed in Section 2.3 and alternatives considered for detailed evaluation are discussed in Section 2.4.

2.2.4 Step 4: Identification of Alternative Routes by Mode of Transit

The Act mandated that a specific road corridor through the Izembek Wilderness within the Izembek National Wildlife Refuge be identified in consultation with the State of Alaska, the City of King Cove, and the Agdaagux Tribe of King Cove. Hovercraft, marine, and air transit were also carried forward to begin the development of possible alternatives. Alternatives that were originally dismissed in the 2003 EIS were not considered for analysis unless they were identified

in the scoping process for the current EIS project. In general, no new data or information was identified to change the 2003 EIS rationale that resulted in dismissal of those alternatives.

2.2.4.1 Road

Several potential road alignments were considered, as were design and management alternatives, including an elevated road and a road restricted to public/commercial shared rides only. The evaluation of road alignments began with previously identified geographic alignments from the 2003 EIS, and variations of the road alternatives considered in that document. Subsequent to the 2003 EIS, 2 road alignments were developed by the City of King Cove, based upon the Alternative 6 alignment in the 2003 EIS. These are referred to as road alignments 6A and 6B. Additional road alignments were reviewed and evaluated with consideration for resource impact topics, such as caribou migration, avoidance of impacts to wetlands, tundra swan nesting locations, and other factors. Briefly summarized in this section are the previously identified road alignment alternatives and the road alignments generated from discussions with the Service and cooperating agencies.

Previously Identified Road Alignment Alternatives

Alternative 6 in 2003 EIS: A 33.5-mile road alignment was proposed to connect the King Cove Airport with the existing Outpost Road to gain road access to the Cold Bay Airport (Figure 2-1). Under this alternative, the road would have been open to the public for general use. An alignment similar to that analyzed in the 2003 EIS was displayed for illustrative purposes in legislative documents related to the Act and in public materials presented during scoping. This alignment is considered to be a minor variation of Alternative 6 in the 2003 EIS and was not analyzed separately.

Road Alignment 6A: After the 2003 EIS was completed, there was further consideration of potential road alignments. A proposed alignment variation was evaluated (ABR 2010) for its potential to minimize potential impacts to waterfowl, particularly Black Brant. The alignment would have run approximately ½ mile north of Kinzarof Lagoon (Figure 2-1). Potential impacts to other wildlife species or wetlands were not evaluated during development of this alignment.

Road Alignment 6B: A second alignment variation was also evaluated after completion of the 2003 EIS (ABR 2010) for its potential to minimize potential impacts to waterfowl, particularly Black Brant. The alignment would have run approximately 1 mile north of Kinzarof Lagoon (Figure 2-1). Potential impacts to other wildlife species or wetlands were not evaluated during development of this alignment.

2011 Road Alignment Alternatives

Two road alignments were developed by the Service and the cooperating agencies, including all entities identified in the Act.

Southern Road Alignment: This proposed road alignment would have an eastern terminus in the vicinity of the Northeast Terminal, at the terminus of the incomplete/permitted King Cove Access Road (currently under construction). The southern alignment would traverse the southern portion of the isthmus, connect to Outpost Trail on the west side of the isthmus, pass to the east of Blinn Lake and join with Outer Marker Road to the south of Blinn Lake and follow Outer Marker Road to St. Louis Road to terminate at the refuge/state boundary. The road would

connect to the Cold Bay Airport via an existing road system (Figure 2-2). The route was developed with considerations for avoiding or minimizing potential impacts to birds, land mammals, fish resources and stream crossings, wetland locations, and other resource concerns.

Central Road Alignment: This proposed road alignment would have an eastern terminus in the vicinity of the Northeast Terminal, at the terminus of the incomplete/permitted King Cove Access Road (currently under construction). The alignment would traverse the central portion of the isthmus and connect to Outpost Trail on the northwest side of the isthmus. The alignment would join with Outer Marker Road to the west of Blinn Lake, and then intersect with and continue along St. Louis Road to terminate at the refuge/state boundary. The road would connect to the Cold Bay Airport via an existing road system (Figure 2-3). The route was developed with considerations for avoiding or minimizing potential impacts to birds, land mammals, fish resources and stream crossings, wetland locations, and other resource concerns.

2.2.4.2 Hovercraft

Three hovercraft alternatives were considered, including operations from Lenard Harbor, operations from the Northeast Terminal as authorized in the 2003 EIS, and hovercraft operations across land. These concepts are briefly summarized in this section. At the time of the screening exercise, the Northeast Terminal operations were still planned and were included in the No Action alternative and Alternative 4 in the Draft EIS. Subsequent changes in the Borough's plans for hovercraft service are detailed under the No Action alternative (Section 2.4.1). Hovercraft operations from the Northeast Terminal are included in Alternative 4 in this Final EIS.

Northeast Terminal Operations: Hovercraft service would be provided from the Northeast Terminal to Cross Wind Cove, connecting to the Cold Bay Airport via an existing road system managed by the State of Alaska (Figure 2-4). Road construction permits have been issued to complete the road connection between Lenard Harbor and the Northeast Terminal, as authorized in the 2003 EIS. Road construction is in progress.

Lenard Harbor Hovercraft Operations: This alternative would operate the hovercraft from the existing Lenard Harbor terminal to the hovercraft terminal at Cross Wind Cove, connecting to the Cold Bay Airport via an existing road system managed by the State of Alaska. This is the same as the route that began operating in 2007 as an interim measure until full operations identified in the 2003 EIS could be implemented (Figure 2-4).

Hovercraft across Land: A hardened linear surface would need to be developed to make hovercraft operations possible across land. The route would initiate in the vicinity of the Northeast Terminal and traverse over the isthmus, through Izembek National Wildlife Refuge and Izembek Wilderness. The alignment would have a western terminus at a junction with Outer Marker Road in the vicinity of Blinn Lake. Outer Marker Road connects to the Cold Bay Airport via an existing State of Alaska road system. This alternative was not geographically delineated, but was assumed to take an inland route, similar to the road alternatives considered.

Figure 2-1 Road Alternatives Considered But Dismissed

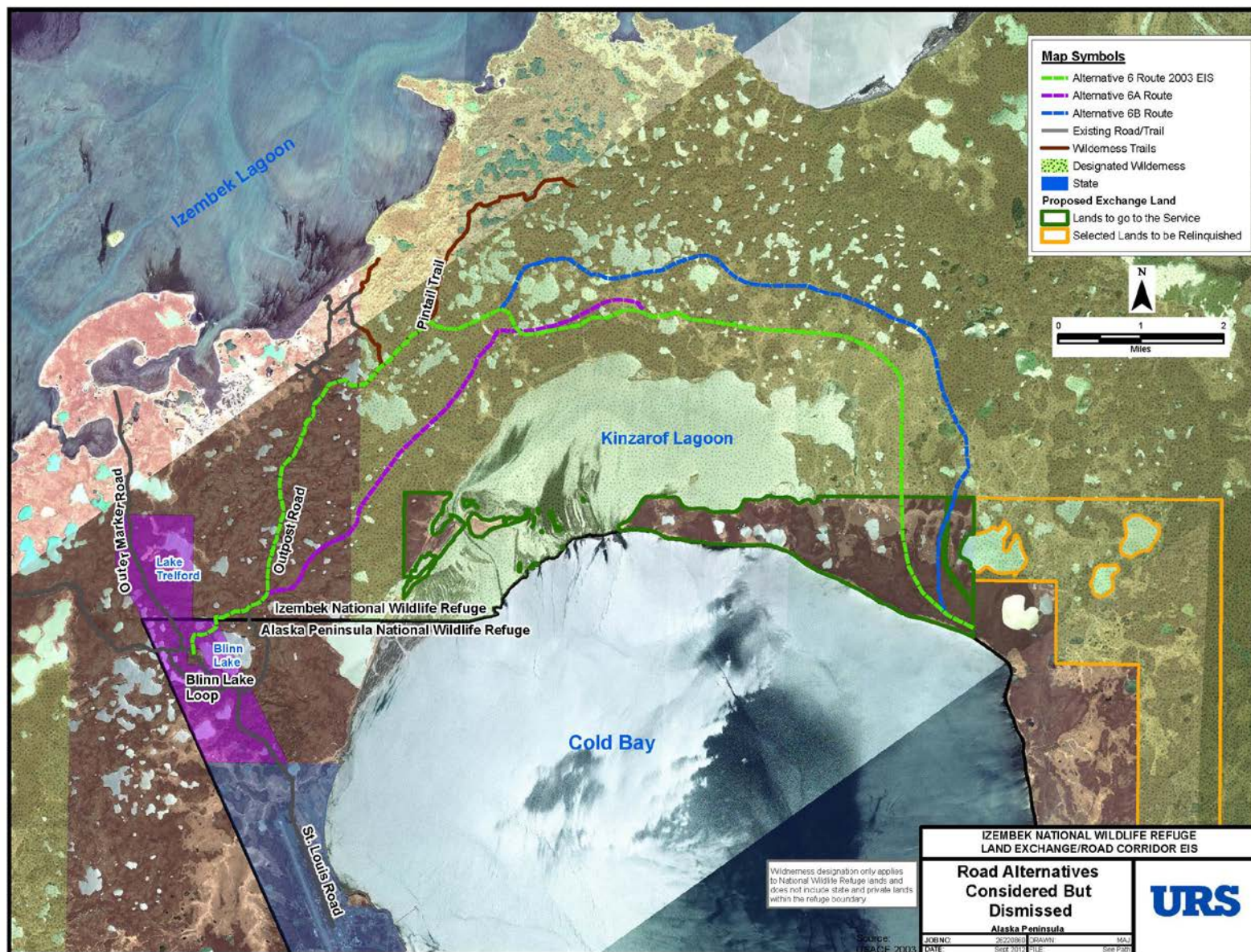




Figure 2-3 Alternative 3 – Central Road Alignment

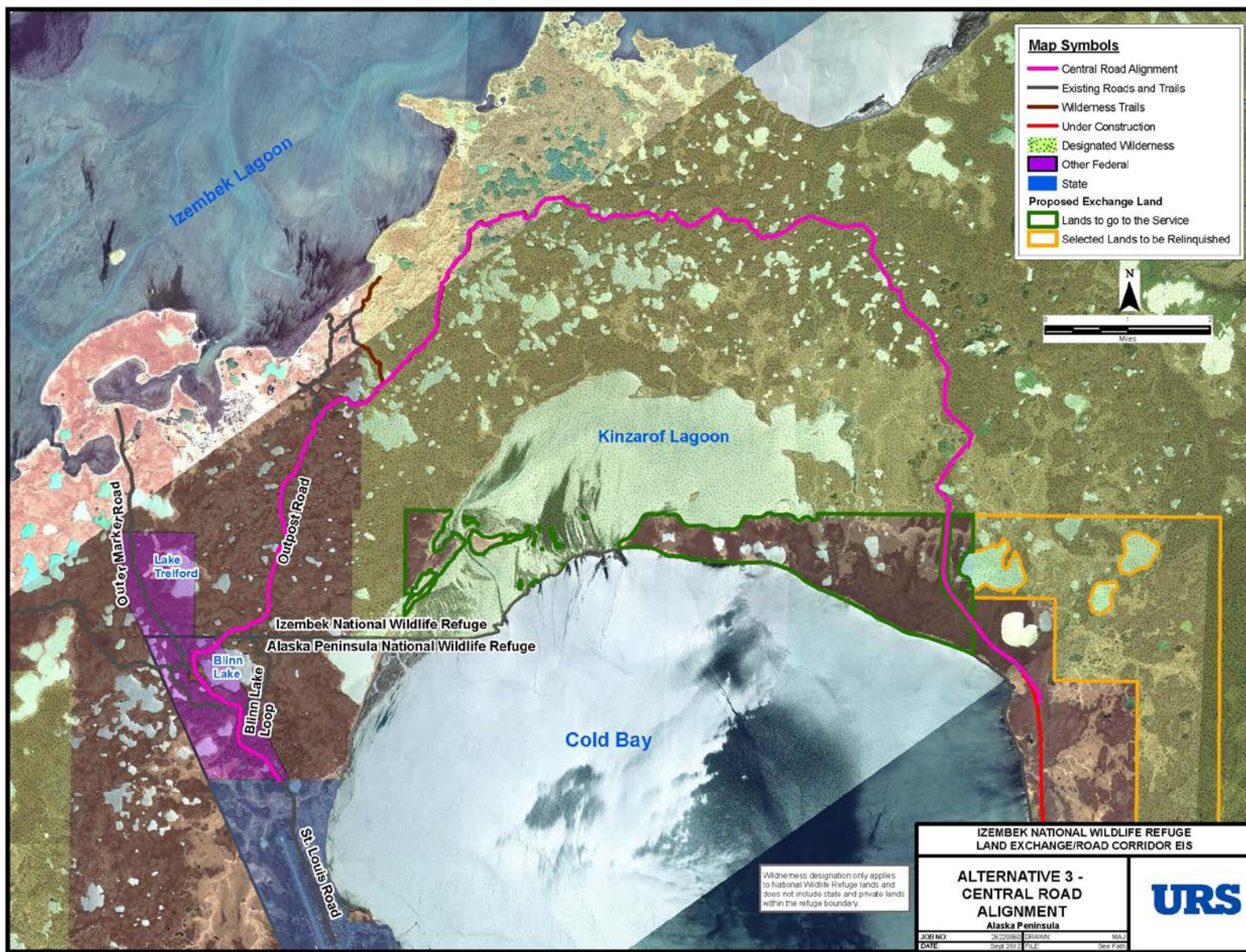
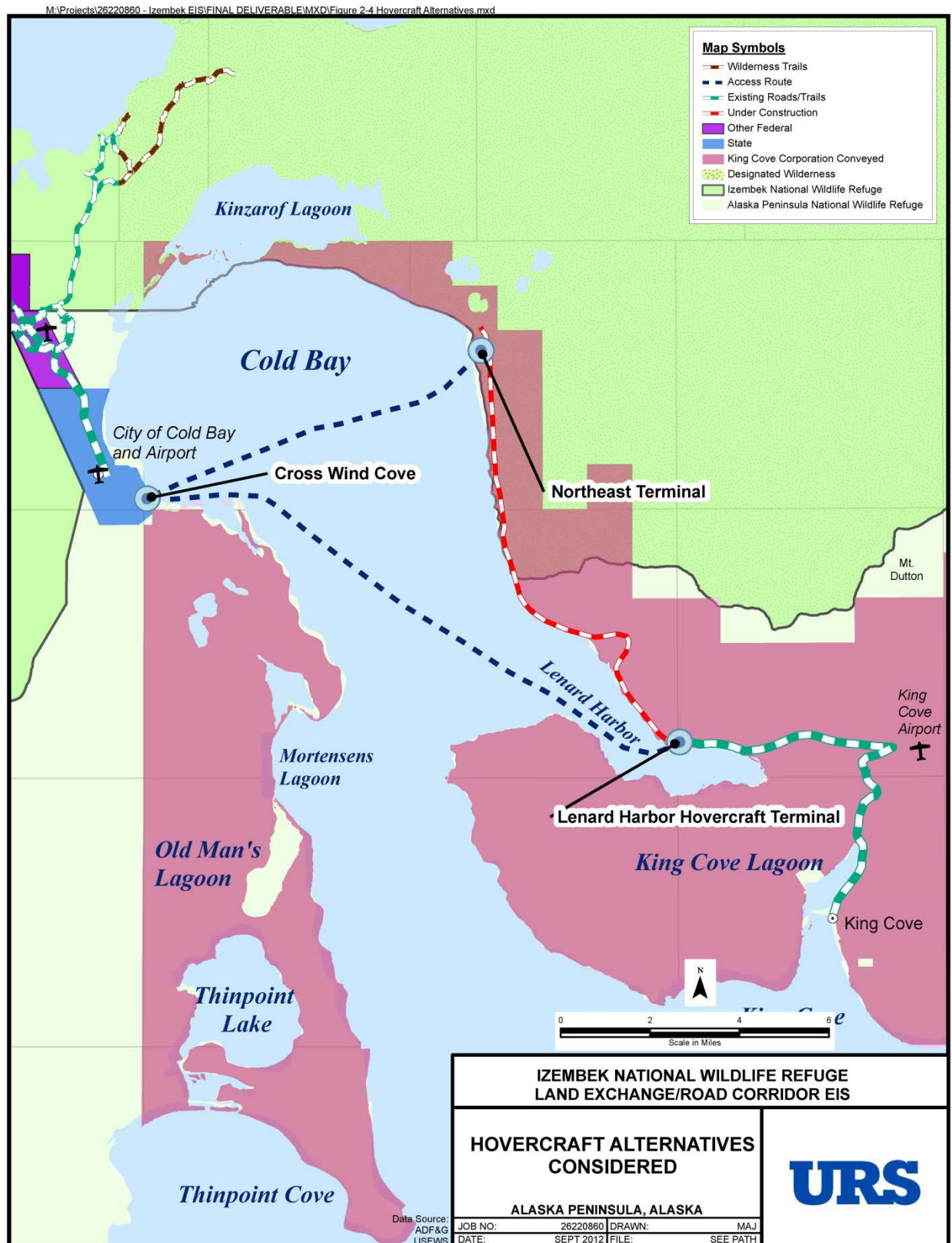


Figure 2-4 Hovercraft Alternatives Considered

2.2.4.3 Air

Several air transit alternatives were considered, including regularly scheduled commercial air service, improvements to the King Cove Airport runway, helicopter service, and medical evacuations via the Coast Guard. These concepts are briefly summarized in this section.

Regularly Scheduled Commercial Air Service: Scheduled commercial small aircraft flights during daylight conditions would be used for transport between the communities.

Seaplanes: Scheduled flights via seaplanes during daylight conditions would be used for transport between the communities.

Improve Existing King Cove Airport Runway: Improvements to the existing runway would allow larger aircraft to land.

Lenard Harbor Helicopter: A leased helicopter and crew (stationed in the City of Cold Bay) would operate between a heliport at the Cold Bay Airport and a heliport at Lenard Harbor. A similar alternative was fully developed and analyzed in the 2003 EIS.

Coast Guard Evacuation: Coast Guard helicopters, which are occasionally stationed temporarily at Cold Bay to monitor commercial fishing and to provide emergency medical evacuations from commercial fishing vessels in the Bering Sea and Pacific Ocean, would be used for medical evacuations from the City of King Cove to the City of Cold Bay.

2.2.4.4 Marine

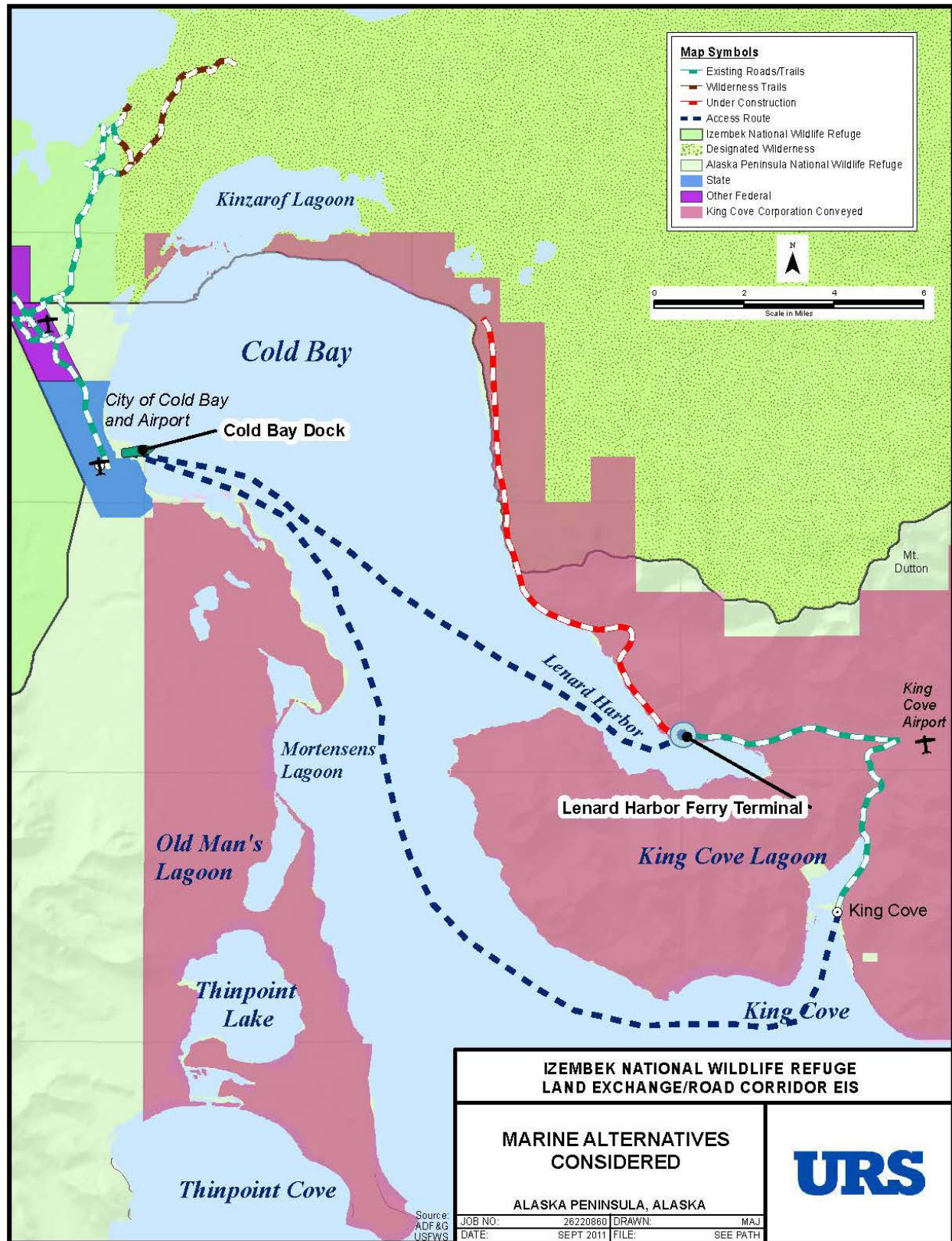
Three marine alternatives were considered, including ferry operations between Lenard Harbor and Cold Bay, improving the existing dock at Cold Bay or developing a new dock or harbor in the area, and emergency transit via local fishing vessels. These concepts are briefly summarized in this section.

Ferry: A new displacement monohull, open-deck ferry with ice breaking capability would travel 14 miles between a terminal in Lenard Harbor and a modified Cold Bay dock (with wave barrier) (Figure 2-5). A similar alternative was fully developed and analyzed in the 2003 EIS. Similar ferry operations were also considered from King Cove Harbor.

Improvements to the Existing Dock at Cold Bay or a New Dock/Harbor: One modification could include a lift system installed on the existing dock at Cold Bay. This would allow vessels tying up at the Cold Bay dock to safely transfer people from the vessel to the dock. Another option could be to construct a small harbor, breakwater, and floating dock for use by fishing and other vessels, and medical emergency transport to the City of Cold Bay from the City of King Cove.

Local Fishing Vessel Transport: Establish a program for local fishing boats to provide medical transport to the City of Cold Bay from the City of King Cove.

Figure 2-5 Marine Alternatives Considered



2.3 Alternatives Considered but Dismissed from Further Analysis

During the course of scoping and the alternatives screening and development process, a number of the routes and modes of transportation described above were considered but eventually eliminated from further analysis. In addition, the alternatives considered but dismissed in the 2003 EIS were reviewed. No alternatives that were originally dismissed in the 2003 EIS were considered for analysis unless they were identified in the scoping process for the current EIS project. The alternatives considered but dismissed in the 2003 EIS are summarized in Table 2.3-1.

2.3.1 Road Alternatives

Previously Identified Geographic Alignments: Previously identified geographic alignments for roads, including those in the 2003 EIS and those developed subsequently, were evaluated and dismissed from further consideration (described in Section 2.2.4.1 of this document and displayed in Figure 2-1). Review of wildlife and wetlands data and consultation with state and federal agencies indicated that alternate alignments developed in 2011 could better avoid areas of wetlands and areas of fish and wildlife resource concern. Thus, previously identified geographic alignments were dismissed from further consideration because they were estimated to have greater adverse impacts than other alternatives.

Elevated Road: As an alternative design, this mode of transit was eliminated due to feasibility of construction, maintenance, and operations, and potential visual, acoustic, bird strike, and safety impacts. The concept of elevated segments for the roadway in selected areas of key resource concerns would be considered for inclusion as a mitigation measure. This alternative was not geographically delineated, but was assumed to take an inland route, similar to the road alternatives considered.

Road Use by Public/Commercial Shared Rides Only: The road footprint to implement this alternative would be essentially the same as a roadway open for public use. It was considered to be a minor variation of the road alternatives; it was eliminated as a stand-alone alternative, because it could be considered as a form of mitigation for road alternatives carried forward for analysis.

Public comments on the Draft EIS included suggestions for additional road alternatives. These were considered but dismissed from further analysis based on the rationale summarized in Table 2.3-2.

Table 2.3-1 Summary of Alternatives Dismissed in 2003 EIS

Alternative	Reason Dismissed
1. Access Road from King Cove Airstrip to a Hovercraft/Ferry Terminal on the North Shore of Cold Bay near the East Entrance to Kinzarof Lagoon	Greater adverse impact than other alternatives
2. Kinzarof Lagoon Ferry	Greater adverse impact than other alternatives
3. Native Lands Road	Congressional approval would be required before option could be implemented; greater adverse impact than other alternatives
4. Former Military /Barge Landing (Trout Creek) Hovercraft Terminal	Minor variation of other alternatives; greater adverse impact than other alternatives (and potential presence of waste/hazardous materials)
5. Road – Light Rail/Monorail Combination	Congressional approval would be required before option could be implemented; greater adverse impact than other alternatives
6. Skunk Hollow Hovercraft Terminal	Minor variation of other alternatives; greater adverse impact than other alternatives
7. Hovercraft Terminal at the Foot of the Cold Bay Dock	Minor variation of other alternatives; greater adverse impact than other alternatives
8. Other Modifications to the Cold Bay Dock or a New Dock	Minor variation of other alternatives; greater adverse impact than other alternatives
9. Russell Creek Ferry Terminal	Greater adverse impact than other alternatives
10. Navy Town Ferry/Hovercraft Ferry Terminal	Greater adverse impact than other alternatives
11. Hovercraft/Ferry Terminal near the Entrance to Mortensens Lagoon	Greater adverse impact than other alternatives
12. Barney's Creek Delta Hovercraft Terminal (North of Lenard Harbor Terminals)	Greater adverse impact than other alternatives
13. Hovercraft/Ferry Terminal 0.5 Mile South of Lenard Harbor Terminals	Minor variation of other alternatives
14. Access Road on South Side of Delta Creek Valley	Greater adverse impact than other alternatives
15. Ferry or Hovercraft from the City of King Cove Harbor to the Western Shore of Cold Bay	Other alternatives better meet purpose and need
16. Small Heavy Weather Vessel for Emergency Evacuations from King Cove to Cold Bay (and other vessels considered)	Other alternatives better meet purpose and need
17. Station and Refuel Hovercraft or Ferry at the City of Cold Bay	Other alternatives better meet purpose and need; minor variation of other alternatives
18. Improve the Existing King Cove Airstrip	Other alternatives better meet purpose and need; mountainous terrain limits potential for improvements to air operations
19. Helicopter Service from the Cold Bay Airport to the King Cove Airstrip or to the City of King Cove	Other alternatives better meet purpose and need; minor variation of other alternatives
20. Authorize the Coast Guard to Make Emergency Medical Evacuations from King Cove to the Cold Bay Airport or to Kodiak/Anchorage	Congressional approval would be required before option could be implemented; beyond the scope of the EIS
21. Construct New Airport near the Northeast Corner of Cold Bay	Minor variation of other alternatives; greater adverse impact than other alternatives
22. Transportation System Capable of Serving Other Remote Communities on the Alaska Peninsula and Bristol Bay	Beyond the scope of the EIS

Table 2.3-2 Summary of Additional Road Alternatives Dismissed

Alternative	Reason Dismissed
1. Road across the Kinzarof spit using bridges	Greater cost and adverse environmental impact than other alternatives
2. Underground wildlife crossings beneath the road	Greater cost and adverse environmental impact than other alternatives
3. Use historical roads and routes established by military to the greatest extent possible	Minor variation of other alternatives
4. Road alignment that avoids the Izembek National Wildlife Refuge	Geography and cost make this alternative infeasible

2.3.2 Hovercraft Alternatives

Northeast Terminal Hovercraft Operations, Seasonal Service: This alternative was evaluated as part of the No Action alternative in the Draft EIS, released in March 2012. As the Draft EIS was approaching completion, the Aleutians East Borough sent the Service a letter stating that it will not resume hovercraft service between the communities of King Cove and Cold Bay. Due to the timing of the letter, the analysis for the Draft EIS was not restructured, but the No Action alternative is now revised in the Final EIS. Seasonal hovercraft operation from the Northeast Terminal was dismissed from further consideration in the No Action alternative. However, Alternative 4 is retained for analysis, with hovercraft service provided 6 days per week from the Northeast Terminal to Cross Wind Cove, as analyzed in the 2003 EIS.

Lenard Harbor Hovercraft Operations: This alternative was operated as an interim measure until full operations authorized in the 2003 EIS could be implemented. This alternative was dismissed from further consideration because the Aleutians East Borough ceased operations from this location due to costs and the reliability of service. Ridership and revenues were substantially lower than projected. Operations were also impacted by weather, which included greater exposure to wind and waves with the location of the hovercraft terminal in Lenard Harbor. Mechanical issues and crew availability also impacted reliability of hovercraft service.

Hovercraft across Land: This alternative was dismissed based on potential substantial acoustic and visual impacts to birds and wildlife species. For a hovercraft to operate across land, a surface would have to be hardened with pavement or planking. In addition to the visual and acoustic impacts, this mode of transit would also have resource impacts to soils, hydrology, and wetlands, similar to those for road construction. It was assumed that the footprint for the hardened surface would be wider than the footprint of a single lane road, due to the size of the hovercraft currently owned by the Aleutians East Borough. Thus, this alternative was dismissed from further consideration because it was estimated to have greater adverse impacts than other alternatives, and other alternatives better addressed the project purpose and need.

For this alternative to be feasible the parties to the land exchange would have to agree to the exchange for the purpose of hovercraft operations across land; this is different from the agreement stated in the Act. This alternative was also not considered to be consistent with the Act; the stated purpose of the proposed land exchange was for the construction of a road. Congressional approval would be required before this option could be implemented.

2.3.3 Air Alternatives

Seaplanes: Seaplanes were considered for transit between the communities of King Cove and Cold Bay. Weather conditions in potential landing areas for seaplanes would be very similar to weather conditions for the King Cove Airport, especially related to visibility, ceiling, and turbulence. Sea conditions could further limit their reliability. These are the primary elements limiting existing air transportation in the project area. Landings would be restricted to daylight hours. Thus, this alternative was dismissed from further consideration because of operating limitations; this alternative did not adequately address the purpose and need.

Improve Existing King Cove Airport Runway: This option would make improvements to the King Cove Airport runway so it could be used by larger aircraft able to fly nonstop between Anchorage, Alaska, and King Cove, Alaska. This alternative was dismissed from analysis in the 2003 EIS with the following rationale (see USACE 2003, Section 2.8.18):

Due to the high terrain adjoining the airport, combined with frequent low ceilings and high winds funneling between Lenard harbor [sic] and Belkofski Bay, the airport cannot be modified to become an all weather airport.

The Alaska Department of Transportation and Public Facilities implemented improvements to the King Cove Airport since the conclusion of the 2003 EIS, including modifications to allow larger aircraft to land. This alternative was dismissed from further consideration as improvements have been made and there are still concerns regarding operation limitations, including terrain and weather conditions.

Lenard Harbor Helicopter: This was a fully developed alternative in the 2003 EIS, but was not selected for implementation in that process. While the resource impacts were not substantial, the economic feasibility of the alternative was low, and that remains the case. Round trip fares would be approximately \$500 per person, substantial subsidies would be required for operation, and total system costs would be high (refer to USACE 2003, Table 2-23). When this alternative was screened using the criteria developed for the current EIS alternatives (Section 2.2), it was found to provide for rapid transport to Cold Bay Airport. This alternative may provide for slightly enhanced air transit reliability, as the Lenard Harbor site avoids some of the topographic constraints found at the King Cove Airport, and a helicopter based in Lenard Harbor can operate in a slightly wider array of weather conditions, relative to fixed wing aircraft at the King Cove Airport. However, other criteria were only partially met or not met at all. This alternative was dismissed from further consideration because other alternatives better addressed the project purpose and need.

Cold Bay Helicopter: In comments on the Draft EIS, a commenter recommended that a helicopter be acquired and staged year round at Cold Bay. As with the Lenard Harbor helicopter alternative, the economic feasibility of this alternative is low, despite the lower level of environmental impact to resources. This alternative was dismissed from further consideration because other alternatives better addressed the project purpose and need.

Coast Guard Evacuation: Congressional legislation and increased budget authority would be required to allow the Coast Guard to routinely provide medical emergency evacuations from the City of King Cove. This alternative was dismissed from analysis in the 2003 EIS in part because of the need for congressional approval. The rationale offered in that document is still valid (see

USACE 2003, Section 2.8.20). In addition, this alternative would not address non-emergency travel needs, or other elements of the purpose and need.

2.3.4 Marine Alternatives

Funding for Local Fishing Vessel Transport: Local fishing boats are currently used in emergency situations to provide medical transport to the City of Cold Bay from the City of King Cove. Local fishing vessel transport is analyzed as a component of the No Action alternative. A funding program to support these services would be a minor variation of the No Action alternative. Thus, this alternative was dismissed from further consideration.

Additional marine alternatives were recommended in public comments on the Draft EIS. These have been considered but are dismissed from further analysis for the reasons summarized in Table 2.3-3.

Table 2.3-3 Summary of Additional Marine Alternatives Dismissed

Alternative	Reason Dismissed
1. High Speed Hydrofoil	Sea ice conditions and financial restrictions make this alternative infeasible.
2. Sea Ambulances	Minor variation of the No Action alternative.
3. Provide a breakwater and disembarkation sufficient to protect and accommodate a 130-foot vessel	Minor variation of other alternatives.
4. U.S. Coast Guard should allow private and unlicensed vessels to transport patients in emergencies	Minor variation of the No Action alternative, since private vessels are presently used in emergencies.

2.3.5 Other Alternatives

Railroad/Light Rail Mode of Transit: This alternative was dismissed from analysis in the 2003 EIS (see USACE 2003, Section 2.8.5) because it may not be consistent with the *Wilderness Act*, congressional approval would be required before the option could be implemented, and alternatives crossing the mouth of Kinzarof Lagoon would have high environmental impacts to the resources of the lagoon. Estimated costs of the rail option were also estimated to be quite high, with \$62.4 million in capital costs, \$320,000 in annual operating costs, and an unsubsidized round trip fare calculated to be \$1,500 (USACE 2003). The dismissal rationale provided in the 2003 EIS is still valid.

Since this option was also identified in the scoping comments for the current EIS process, but with an inland route, the rail option was also screened. It was dismissed from further consideration because it did not meet the purpose and need and other screening criteria, and the estimated impacts to resources was not less than other alternatives. In addition to higher costs for rail, an important difference between the road and railroad screening rating was the need for specialized operations and maintenance equipment and trained personnel. A rail option would require high levels of specialized equipment and trained personnel.

An inland route for rail transit would have essentially the same route as a road, with resource impacts to soils, hydrology, and wetlands similar to those for road construction. While a railroad would not require vehicle turnouts, design of a railroad requires a very low gradient and may therefore have increased corridor length and greater slope cuts and fills to accommodate the grade constraints, based on the topography of the isthmus. At higher fills (to accommodate

grade), the base of the rail bed would be wider than that of a road. These high fills could become barriers to wildlife migration. While the rail option could contain travelers to the travel way, mitigation measures considered for other alternatives could also help contain travelers to the travel way.

For this alternative to be feasible, the parties to the land exchange would have to agree to the exchange for the purpose of rail operations, which is different from the agreement stated in the Act. This alternative was also not considered to be consistent with the Act, in that the stated purpose of the proposed land exchange was for the construction of a road. Congressional approval would be required before this option could be implemented.

Thus, this alternative was dismissed from further consideration because it:

- Was dismissed in the 2003 EIS for the reasons noted above, and the rationale is still considered to be valid;
- Did not meet the purpose and need and other screening criteria, including cost and requirements for not needing specialized equipment and trained personnel;
- Was estimated to have greater resource impacts than other alternatives; and
- Would require congressional approval before the alternative could be implemented.

King Cove Medical Facility: The construction and operation of medical facilities in the community of King Cove that could address urgent care needs was included in the screening process for the current EIS, as suggested in scoping. This option was eliminated from further consideration because it did not meet the purpose and need. In essence, it addressed some of the health and safety issues, assuming that trained practitioners could be secured for the new facility. However, there would be considerable challenges in recruiting and retaining qualified staff to operate the facility, which would likely result in substantial staffing costs. In comments on the Draft EIS, a commenter suggested that local medical services in King Cove could be improved by using pay incentives or rotating doctors from contracted hospitals. This is a variation on the previously proposed alternative and is dismissed from further analysis for the same reasons.

In addition, this alternative would not address the transportation needs of the community of King Cove and the quality of life aspects of the purpose and need. The cost for this option was also estimated to be high, in relation to other alternatives.

2.4 Alternatives Considered for Detailed Evaluation in the EIS

2.4.1 Alternative 1 – No Action

Council on Environmental Quality regulations (1502.14(d)) require an EIS to include an alternative of No Action. The No Action alternative is analyzed as a baseline for comparative purposes with the action alternatives. This alternative would not meet the purpose and need identified for the project (Sections 1.3 and 1.4).

Summary of Correspondence Concerning the No Action Alternative

On November 15, 2011, the Aleutians East Borough sent the Service a letter stating they will not resume hovercraft service in the foreseeable future.

On December 14, 2011, the Service requested information from the Aleutians East Borough to inform development of the revised No Action alternative.

On February 24, 2012, the Aleutians East Borough provided information to the Corps regarding its decision to cease hovercraft operations, a component of the marine-road link permitted by the Corps.

On March 20, 2012, the Corps responded to the Aleutians East Borough's proposal indicating that the proposed vessel would meet the purpose and need of the permit.

On March 29, 2012, The Aleutians East Borough responded to the Service's letter of December 14. The letter indicated:

- The Aleutians East Borough hoped the Secretary of Interior would approve the land exchange to enable road construction.
- The correspondence with the Corps was referenced, indicating if the road was not approved, the Aleutians East Borough would develop an alternative marine transportation link between the communities of King Cove and Cold Bay. A landing craft/passenger ferry, believed to be more technically and financially viable than a hovercraft, was being explored.
- The hovercraft will be moved to another federal project, the Akutan Airport.

On April 18, 2012, the Service requested information from the Aleutians East Borough regarding basic operating assumptions for the proposed landing craft/passenger ferry so the No Action alternative could be appropriately revised. The Service indicated if a timely response was not received, the Service would make assumptions based on similar ferries used elsewhere in Alaska.

On July 9, 2012, the Aleutians East Borough responded it was not able to answer any of the questions posed by the Service and referred the Service to the Aleutians East Borough's letter to the Corps dated February 24, 2012.

The referenced correspondence is available in Appendix I.

Under Alternative 1, the Service would not exchange lands with King Cove Corporation and the State of Alaska for the purpose of constructing a road between King Cove and Cold Bay, Alaska. Current modes of transportation between the cities of King Cove and Cold Bay would continue to operate. These include air, marine, and construction of infrastructure to support a marine-road link. The marine component of the marine-road link does not presently exist, but could be served by a landing craft/passenger ferry in the future if the land exchange is not approved (AEB

2012) (Appendix I). Thus, the project purpose (Section 1.3) would not be met because a land exchange would not be executed for the purpose of constructing a road as specified in the Act. The project needs (Section 1.4) of health and safety, quality of life, and affordable transportation would not be met if a new mode of transportation is not implemented, but might be met by the landing craft/ferry, depending on levels of service.

Air: Regularly scheduled commercial air service between the cities of King Cove and Cold Bay would continue. Peninsula Airways has provided commercial flights using small single and twin engine aircraft, but announced in August 2012 that the airline was phasing out its air taxi service (Alaska Dispatch 2012; Anchorage Daily News 2012). News releases on the subject indicated that Peninsula Airways would continue service to the communities until another airline has assumed the routes. Thus, while the carrier may change, this alternative assumes that air service between Cold Bay Airport and King Cove Airport would continue to be available. In addition, the Coast Guard would continue to provide occasional medical evacuations via helicopter when Coast Guard assets are in the vicinity and not committed to other assignments.

Marine: Personal transit and medical evacuation transport by local fishing vessels between the cities of King Cove and Cold Bay would continue. The Alaska Marine Highway System would continue to provide ferry service between the communities of King Cove and Cold Bay approximately twice a month beginning in late spring until early fall (approximately May through September) as part of the Southwest Alaska and Aleutian Chain schedule. The Cold Bay dock would not be modified and a harbor would not be constructed.

Marine-Road Link: Hovercraft service provided by the Aleutians East Borough from Lenard Harbor to the City of Cold Bay hovercraft site at Cross Wind Cove was suspended in November 2010. In November 2011 the Aleutians East Borough announced that hovercraft service would not resume. Since operations began in 2007, the Aleutians East Borough stated that there were issues with operability and reliable service from Lenard Harbor. Revenue generated by operations did not meet initial projections. According to the Aleutians East Borough, operation costs exceeded revenues, requiring an annual subsidy of over \$1 million by the Aleutians East Borough. The Aleutians East Borough determined that it could not sustain these costs. With no further hovercraft service planned for the community of King Cove, the hovercraft was modified and transferred to Akutan in 2012 where it is providing transportation between the City of Akutan and the Akutan Airport on Akun Island.

In a February 24, 2012 letter to the Corps (Appendix I), the Aleutians East Borough stated it is exploring an aluminum landing craft/passenger ferry to provide a marine-road link between the Northeast Terminal and Cross Wind Cove if the land exchange and road corridor are not approved. This letter states,

It is the fervent hope of the AEB [Aleutians East Borough], the City [of King Cove], the King Cove Corporation and the Agdaagux and Belkofski Tribes that the Secretary [of the Interior] will approve the land exchange. If so, the road to the Northeast Corner [Northeast Terminal] will become a key element in the implementation of the Izembek National Wildlife Land Exchange Act which will authorize the construction of additional road mileage from the Northeast Corner [Northeast Terminal] to connect the City of King Cove with the Cold Bay Airport.

If the Secretary does not approve the land exchange, the AEB [Aleutians East Borough] will develop an alternative transportation link between King Cove and Cold Bay. Any

alternative we develop will include the utilization of the road to Northeast Corner [Northeast Terminal] and associated facilities, now being constructed under the King Cove Health and Safety Act and COE [Corps] Permit # 2-2000-0300 Cold Bay 12.

...A transportation link the [Aleutians East] Borough is exploring (and we believe holds promise) is an aluminum landing craft/passenger ferry. ... The [Aleutians East] Borough hopes that this type of a transportation link could be more technically and financially viable than a hovercraft.

The estimated completion date of the permitted road from the City of King Cove to the Northeast Terminal is in 2013. A date for deciding whether to acquire a landing craft/passenger ferry was not stated, but it is assumed the decision would be made after the public interest determination by the Secretary of the Interior if that decision is to not proceed with a land exchange. The vessel described by the Aleutians East Borough is a 59-foot by 16-foot landing craft, consistent with the illustration and description provided in the letter to the Corps (AEB 2012). According to the Aleutians East Borough, the vessel could accommodate approximately 30 passengers, occasional wheeled vehicles/ambulances, and limited cargo.

Neither the February 24, 2012 letter to the Corps of Engineers, nor subsequent correspondence with the Aleutians East Borough, contain any description of the frequency of service being considered by the Aleutians East Borough or the costs associated with the acquisition and operation of a landing craft/passenger ferry. The vessel would operate between the Northeast Terminal and Cross Wind Cove, the same route analyzed in the 2003 EIS.

As stated in the Aleutians East Borough letter to the Corps (AEB 2012), the vessel bottom would be hardened with replaceable wear pads to prevent damage to the hull from abrasion, allowing the vessel to use the former hovercraft terminals.

While the Aleutians East Borough provided no cost information, research was done by the Service on the possible costs for acquisition of a vessel matching the type described by the Aleutians East Borough. That research revealed that a vessel of the type described in general terms by the Aleutians East Borough could cost at least \$500,000, including installation of engines and delivery of the craft (Crews 2012). It is assumed there would be no new capital costs for completion of the road to the Northeast Terminal, nor for the operation of the building, fuel tanks, generator, water system, and concrete landing ramp, since these are planned for completion under the previous contract to construct the road to the Northeast Terminal (see Section 2.2.4.2 for details.)

While the Northeast Terminal infrastructure was originally included in the construction project, under the Aleutians East Borough's revised plans to discontinue hovercraft service, the Alaska Department of Transportation and Public Facilities has modified the construction plans accordingly. The former hovercraft building (or hangar) has been cancelled (Croghan 2012). However, other infrastructure to support a marine link from the Northeast Terminal site remains on the construction plan (Lundell 2012). These include:

- two bulk fuel tanks (1000 gals. each);
- an operations building (10 feet by 50 feet);
- a generator building (10 feet by 20 feet);

- water lines from an existing well to the operations building and septic tank; and
- a concrete landing ramp.

Because the Aleutians East Borough has provided no information on its operation plans for the landing craft/passenger ferry should it be acquired, no estimates have been made as to annual revenue or costs of operation since they would be too speculative. Maintenance costs for 17.6 miles of road (between the City of King Cove and the Northeast Terminal) are based on an annual costs estimate of \$18,000 per lane mile per year for the Cold Bay region, based on conversation with Alaska Department of Transportation and Public Facilities (Maintenance and Operations). Thus, monthly road maintenance is estimated at \$26,500 for the road between the City of King Cove and the Northeast Terminal. No additional road maintenance costs were considered between Cross Wind Cove and Cold Bay Airport.

Table 2.4-1 provides a summary of the No Action alternative and a comparison to other alternatives.

Table 2.4-1 Comparative Summary of Alternatives

	Alternative 1: No Action	Alternative 2: Land Exchange and Southern Road Alignment	Alternative 3: Land Exchange and Central Road Alignment	Alternative 4: Hovercraft Operations (No Land Exchange)	Alternative 5: Lenard Harbor Ferry with Cold Bay Dock Improvements (No Land Exchange)
New Footprint in Acres	0	107	100	0	1.9
Acres Removed from Izembek Wilderness by Land Exchange	0	131	152	0	0
Acres Added to Wilderness by Land Exchange	0	44,491 (includes State parcel and Kinzarof parcel)	44,491 (includes State parcel and Kinzarof parcel)	0	0
Acres of Land Selection Relinquished in Wilderness	0	5,430	5,430	0	0
Acres of Land Selection Conveyed	5,430 (in Wilderness)	5,430 (non-Wilderness)	5,430 (non-Wilderness)	5,430 (in Wilderness)	5,430 (in Wilderness)
Estimated Area of Exchange Parcel for Road Corridor	0	201	227	0	0
Acres Removed from Alaska Maritime National Wildlife Refuge (Sitkinak Island)		1,619	1,619		
New Acres of Wetlands Filled on Corporation Land		1.1	1.1		0.4
New Acres of Wetlands Filled in Wilderness		2.7	1.3		
Total New Acres of Wetlands Filled	0	3.8	2.4	0	0.4
Capital or Construction Cost in Millions	Unavailable	\$21.7	\$23.7	\$11.0	\$27.1
Maintenance/ Annual Operation Costs	Unavailable	\$670,000	\$710,000	\$2.4 Million	\$2.6 Million
Lifecycle Cost in Millions	Unavailable	\$34.2	\$37.0	\$52.8	\$71.7

Capital cost assumptions:

Alternative 1: Cost of a future landing craft/passenger ferry \$500,000 estimated; other capital costs, maintenance/annual operation costs, and lifecycle costs are unknown at this time

Alternative 2: Cost of road \$20,660,000; capital cost to acquire 4 pieces of maintenance equipment \$1,000,000

Alternative 3: Cost of road \$22,730,000; capital cost to acquire 4 pieces of maintenance equipment \$1,000,000

Alternative 4: Cost of hovercraft \$9,000,000; cost to ship hovercraft \$250,000, deicing modifications \$1,400,000, new 120' x 80' hovercraft heated shelter \$300,000

Alternative 5: Cost of ferry \$9,000,000 based on similar cost for Ketchikan Ferry (\$7.4 m), plus transport to Cold Bay and design, administrative costs; cost of Lenard Harbor dock facilities \$5,600,000; cost of Cold Bay dock modifications \$12,500,000

2.4.2 Alternative 2 – Land Exchange and Southern Road Alignment

Agencies consulted in the development of this alternative include the Alaska Department of Natural Resources, Alaska Department of Fish and Game, Alaska Department of Transportation and Public Facilities, the Service, Agdaagux Tribe of King Cove, Aleutians East Borough, and City of King Cove. Table 2.4-2 provides a summary of Alternative 2 and comparison with Alternative 3. Table 2.4-1 provides a comparison of all alternatives.

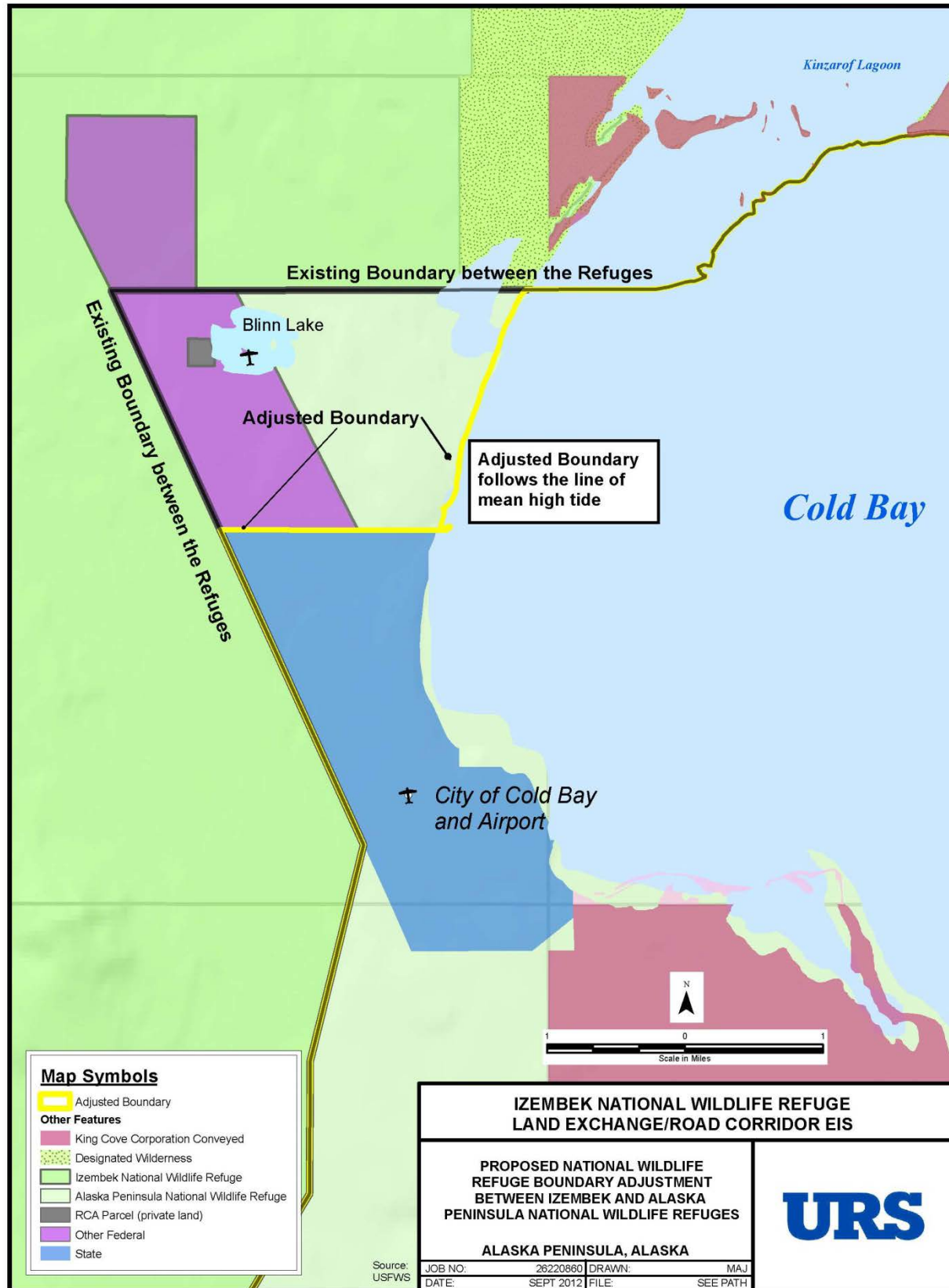
Alternative 2 includes a land exchange between the federal government, State of Alaska, and King Cove Corporation, as described in the Proposed Action (Section 1.2). Legal descriptions for exchange parcels are provided in Appendix B and an overview of parcels proposed for exchange is presented in Section 2.4.6. The estimated amount of federal land exchanged in this alternative for the road corridor would be 201 acres, including 131 acres in Izembek Wilderness, assuming a 100-foot corridor width. A constant 100-foot width was used for analysis purposes for this EIS; the final corridor width in the final land exchange documents would have a similar footprint area but would have a variable width, with an average of 100 feet. The variable width would adapt to constraints defined by more detailed engineering, based on a more in depth geotechnical investigation and acquisition of more refined ground surface data.

Under this alternative, the Service would execute an administrative boundary adjustment in the vicinity of Blinn Lake, in accord with ANILCA Section 103(b). An area that is currently designated as Alaska Peninsula National Wildlife Refuge, but administered by Izembek National Wildlife Refuge, would become part of Izembek National Wildlife Refuge (see Figure 2-6).

The southern road alignment (Figure 2-2) would originate at the terminus of the King Cove Access Road (currently under construction) in the vicinity of the Northeast Terminal. The initial 6 miles are co-located with the central alignment (Alternative 3). The southern alignment would cross 2 fish bearing streams. At a point 6 miles north of the Northeast Terminal, the southern alignment would depart from the central alignment in a westerly direction, and stay south of the ridge line that separates the watersheds of the Kinzarof and Izembek lagoons. The alignment would continue westerly, avoiding lakes, and crossing 6 fish bearing streams (Table 2.4-3). At about 12.4 miles from the start, the southern alignment would again be co-located with the central alignment and follow Outpost Trail (which transitions to Outpost Road) in a southwesterly direction to a point just north of Blinn Lake. At that point, the southern alignment would depart from the central alignment, following an existing primitive road for approximately 1.4 miles around the east and south side of Blinn Lake to intersect with Outer Marker Road. The route would continue south along Outer Marker Road to its intersection with St. Louis Road, and then follow St. Louis Road to terminate at the refuge/state boundary.

The portion of the alignment that is exclusive to the southern alignment (not co-located with the central alignment) would be located only in the watershed of Kinzarof Lagoon. The co-located alignment would be located in the watersheds of Izembek and Kinzarof lagoons. The road corridor would be located approximately ½ mile to 1 mile north of Kinzarof Lagoon (Figure 2-2). This alignment is intended to strike a compromise between minimizing disturbance to Black Brant (through distance from Kinzarof Lagoon) and disrupting caribou migration through the isthmus. The route was designed to avoid or minimize impacts to wetlands, minimize stream crossings, and to accommodate terrain considerations.

Figure 2-6 Proposed National Wildlife Refuge Boundary Administrative Adjustment



The comparisons of Alternatives 2 and 3, including the number and type of drainage structures, fill quantities, and typical roadway sections and design details presented in tables and figures, are estimates calculated for analysis purposes. Final project design and construction details may be different. Additional design criteria are discussed later in this section and in Appendix E.

Table 2.4-2 Comparative Summary of Road Alternatives

	Alternative 2: Land Exchange and Southern Road Alignment	Alternative 3: Land Exchange and Central Road Alignment
Road Corridor in Acres, Assuming Average 100-Foot Width	236	262
Total Length of Corridor (miles)	19.4	21.6
Road Corridor in Acres Proposed for Exchange from National Wildlife Refuge	201	227
Road Corridor in Miles Proposed for Exchange from National Wildlife Refuge	16.5	18.7
Road Corridor in Acres Proposed for Exchange from Izembek Wilderness	131	152
Road Corridor in Miles Proposed for Exchange from Izembek Wilderness	10.8	12.5
Road Corridor in Acres on Lands Owned by King Cove Corporation	35	35
Road Corridor in Miles on Lands Owned by King Cove Corporation	2.9	2.9
Total Road Footprint of New Construction in Acres	107	100
Average Road Footprint Width in Feet	47.6	41.4
Maximum Road Footprint Width in Feet	91	92
Minimum Road Footprint Width in Feet	30	30
Width of Traffic Lane in Feet	13	13
Width of Safety Turnout in Feet	11	11
Miles of Road Construction	18.5	20.0
Miles of Road Constructed/Reconstructed on Existing Roads/Trails	6.0	9.0
Miles of Road Constructed on Lands with No Previous Road	12.5	11.0
Miles of Existing Road in Exchange Corridor Requiring No Construction	0.9	1.6
Number of Turnouts for Passing	136	158
Drainage Structures	162	173
Bridges	1	1
Culverts or Bridges	7	1
Cross Culverts (Pipes)	154	171
Material Site(s)*	1	1
Total Fill Quantity in Cubic Yards	256,000	302,000
Fill Quantity from Material Site in Cubic Yards	182,000	231,000
Material Site Footprint in Acres	6	7
Acres of Wetlands Filled for Road Construction	3.8	2.4
Quantity of Fill in Wetlands for Road Construction in Cubic Yards	20,000 to 25,000	11,000 to 15,000

	Alternative 2: Land Exchange and Southern Road Alignment	Alternative 3: Land Exchange and Central Road Alignment
Disposal Sites	0	0
Quantity of Unusable Excavated Material in Cubic Yards	0	0
Acres of Uplands Reclaimed with Excavated Material	0.3	2.4
Temporary Barge Landing Sites	2	2
Area of Barge Landing Site in Acres	0.5	0.5
Acres of State Tidelands in Barge Landing Site	Less than 0.1	Less than 0.1
Fill Quantity for Barge Landing Site Development in Cubic Yards	1,200	1,200
Fill Quantity Below High Tide Line in Cubic Yards	1,000	1,000
Upland Fill Quantity in Cubic Yards	200	200

Note: *One site identified; if that site is not sufficient, other sites may be located in the future to generate the same estimated quantity on private lands.

Components

Alternative 2 consists of the following major components:

- Land exchange between the federal government, the State of Alaska, and the King Cove Corporation for the purpose of constructing a road between the City of King Cove and Cold Bay Airport (201 acres of federal land included in exchange from Izembek National Wildlife Refuge and Alaska Peninsula National Wildlife Refuge, and other parcels as outlined in Table 2.4-6 and Appendix B).
- Construction of 18.5 miles of a single lane gravel road from the Northeast Terminal to Outer Marker Road; approximately 6.0 miles of road would include existing roads and trails. All 6.0 miles of proposed road on existing roads and trails would require full reconstruction. Approximately 12.5 miles of road would be on land with no previous road. An additional 0.9 miles along the existing Outer Marker Road and St. Louis Road would complete the land exchange corridor; no road construction or reconstruction would occur on this segment of the exchange parcel.
- The exchange parcel for the road corridor would include the federal lands from the Izembek National Wildlife Refuge boundary on the east side of the proposed road corridor to the boundary with state lands on the west side of the proposed alignment. The proposed exchange parcel is estimated to be 19.4 miles long, 100 feet wide, and contain 201 acres. The exchange parcel for the road corridor would not include the private lands owned by King Cove Corporation between the Northeast Terminal northward to the existing boundary with Izembek National Wildlife Refuge and Izembek Wilderness.
- A barrier installed along the length of the roadway on both sides, as specified in the Act, to prevent vehicles from accessing the Izembek National Wildlife Refuge and Izembek Wilderness lands adjacent to the road. Two barrier types are being analyzed for this project: a chain barrier and a bollard barrier, as illustrated in Figure 2-7.
- Approximately 162 drainage structures would be required consisting of 1 major crossing requiring a bridge, 7 minor crossings requiring either box culverts or small bridges, and

approximately 154 cross drainage culverts. (Refer to Appendix E for plan and profile sheets.)

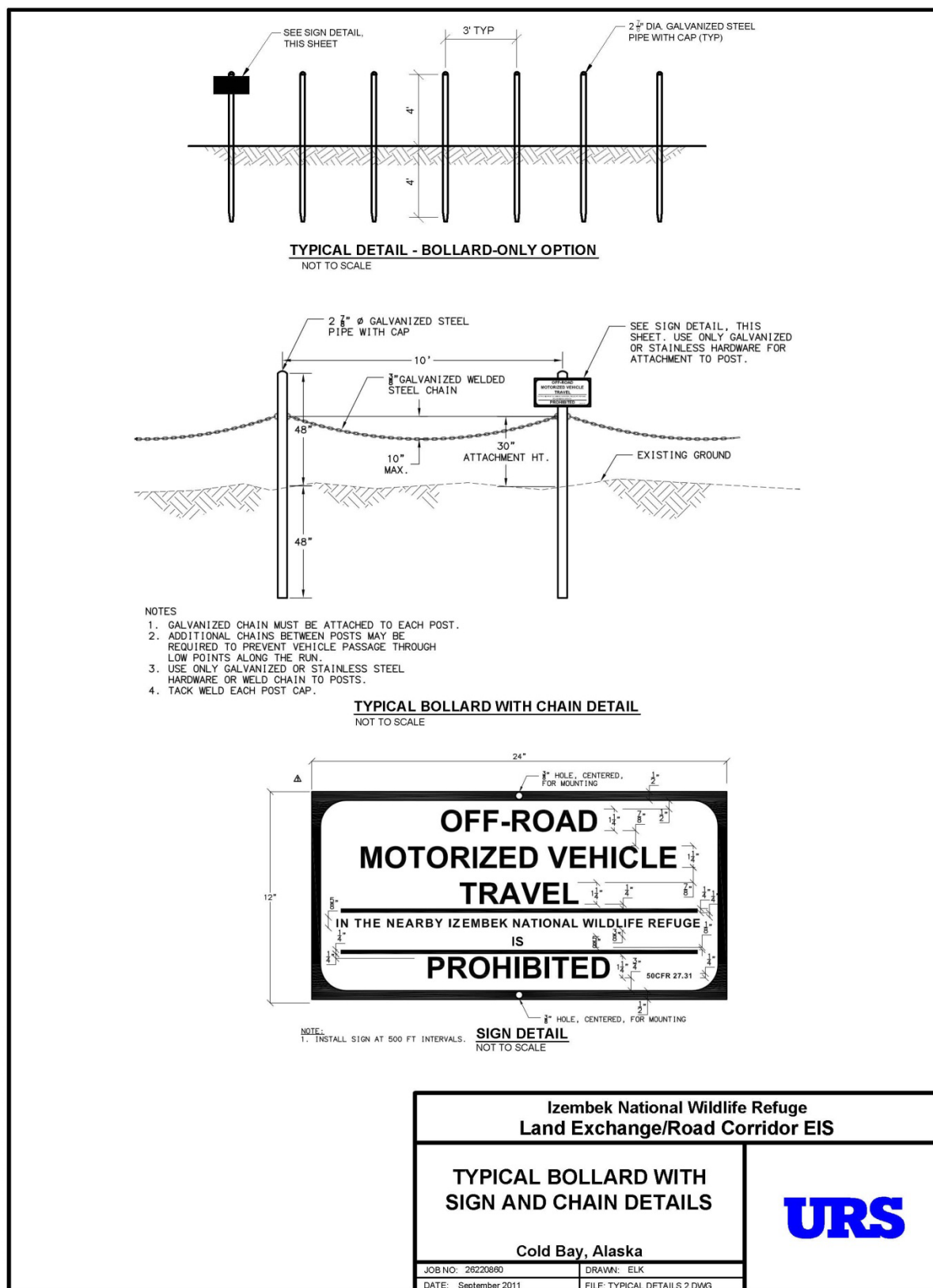
- One or more material sites and 2 temporary barge landing sites/staging areas are anticipated for use in road construction. The barge landing sites would be located at the Northeast Terminal and Cross Wind Cove hovercraft sites, placed immediately adjacent to existing hovercraft ramps. Barge landings would have an area of 0.5 acres, with a larger staging area located on adjacent uplands, at the Northeast Terminal and City of Cold Bay.
- A material site was developed near the Northeast Terminal for the King Cove Access Project, and expansion of that material site for the proposed road would require additional permitting and geotechnical exploration to verify adequate materials are available. It is likely additional gravel sites could be developed to the northeast of the existing gravel pit site near the Northeast Terminal, based on observations of road cut banks and probing efforts during the site visit. Existence of suitable gravel quality and quantities at these sites would have to be verified by a geotechnical investigation prior to final design for construction, if the land exchange is approved. These sites are on King Cove Corporation lands and could likely be permitted for gravel extraction if a geotechnical investigation verifies suitable quality materials. Two material sites on the west side of Cold Bay include Blue Bill pit, owned and operated by the Service, and the Johnnie pit, operated by the Federal Aviation Administration. Gravel materials from those sites have a high sand content, limited remaining usable gravel deposits, and would not be available for this project because the materials are committed to maintenance requirements for the Federal Aviation Administration and the Service. No other viable material source was identified in Cold Bay. Other possible material sites could include the Lenard Harbor quarry site, which would require additional permitting, and a quarry at Sand Point owned by Shumagin Corporation. The Sand Point material would have to be barged to Cold Bay, which could add \$2 to \$3 million to the cost to construct the road. Organic materials would be stockpiled within the construction corridor for subsequent placement on finished back slopes and abandoned sections of existing roads and trails.

Ownership of Project Lands

Alternative 2 would include a land exchange, as proposed in the Act and described in the proposed action (Section 1.2) and legal description of parcels (Appendix B). An overview of parcels proposed for exchange is also presented in Section 2.4.6.

In summary, the federal government would convey to the State via fee title approximately 201 acres for a corridor through the Izembek National Wildlife Refuge, including 131 acres in Izembek Wilderness, assuming a 100-foot corridor width. As previously stated, the Service would execute a boundary adjustment between Izembek National Wildlife Refuge and Alaska Peninsula National Wildlife Refuge, in accord with ANILCA Section 103(b) (Figure 2-6). Subsequently, all conveyed lands for the road corridor would be from Izembek National Wildlife Refuge. The federal government would also convey to the State fee title to the parcel on Sitkinak Island, consisting of approximately 1,619 acres. Refer to Appendix B for additional information regarding proposed parcels for exchange and a potential phasing of conveyance of a portion of the Sitkinak Island parcel, pending contaminated site remediation.

Figure 2-7 Typical Bollard With Sign and Chain Details



The State would convey the parcels adjacent to the North Creek Unit of the Alaska Peninsula National Wildlife Refuge to the Service (41,887 acres), which would become designated wilderness under the terms of the Act. This conveyance would include title to the subsurface estate but the State of Alaska would retain ownership of submerged lands including those beneath tidelands and certain lakes, rivers, and streams. (Refer to Figure 1-1 for general locations of proposed exchange parcels or Table 2.4-6 and Appendix B for specific proposed exchange parcels.)

Upon completion of the land exchange, Izembek State Game Refuge would also include state lands and water in the vicinity of Kinzarof Lagoon, in accord with the *Izembek State Game Refuge Land Exchange Bill*.

King Cove Corporation would convey to the Service the parcels in the vicinity of Kinzarof Lagoon and Mortensens Lagoon (approximately 10,696 acres). The Corporation would also relinquish the selection of a parcel in Izembek Wilderness (5,430 acres) and a substitute parcel would be selected in Alaska Peninsula National Wildlife Refuge. The Kinzarof Lagoon parcel (2,604 acres) would become designated wilderness under the terms of the Act.

Design Criteria

Design guidance was based on the American Association of State Highway and Transportation Officials *Policy on Geometric Design of Highways and Streets* (“Green Book”) and *Guidelines for Geometric Design of Very Low Volume Roads* (AASHTO 2001, 2004), and the Alaska Department of Transportation and Public Facilities *Alaska Highway Pre-Construction Manual* (ADOT&PF 2005). The road alignment presented in this alternative was developed to a 35 percent design level. A centerline survey, geotechnical investigations, or other detailed site surveys have not been completed. The road alignment was developed at a level of detail sufficient to compare alternatives, such as alignment, grade, width, costs, and resource impacts.

Two-way single lane roads can be used in areas where traffic is less than 50 vehicles a day. The average daily traffic estimate provided in the 2003 EIS of 35 was used for design standards. Even though that projection included some commercial traffic that would not be a part of the current alternatives, it is still below maximum traffic considered for a single lane road. The low volume guidelines (AASHTO 2001, 2004) apply to roads with equal to or less than 400 vehicles a day.

The *Guidelines for Geometric Design of Very Low Volume Roads* recommends a width between 11 feet and 13 feet for a single lane two-way road. The guidelines require a minimum travel lane width of 9 feet, and the *Alaska Highway Pre-Construction Manual* requires a minimum 7-foot clear zone (obstruction free zone for safety) on each side of the travel lane. The proposed width for the southern road alternative would be 13 feet, which would include a 9-foot travel lane and 2-foot shoulders on each side. The 2-foot shoulders combined with the 5-foot wide foreslope (see Figure 2-8) would fulfill the requirement of the 7-foot clear zone. Maximum road grades would be limited to 12 percent in accord with the American Association of State Highway and Transportation Officials guidelines. Grades over 9 percent would be limited to short distances, which would occur in an estimated 0.2 miles of the total 18.5 mile length of road construction.

The 18.5 miles of single lane gravel road would be constructed with an estimated 136 inter-visible turnouts for passing. Each turnout would be a 50-foot long by 11-foot wide gravel surface parallel to the traffic lane. Turnouts would be placed with a maximum spacing of 900 feet or

closer to ensure inter-visibility between turnouts. The typical section is shown in Figure 2-8 and would consist of a 6-inch aggregate base course/crushed rock surface course over 18 inches “Type B” gravel over 12 inches of “Type C” gravel. Layer thicknesses shown are preliminary and may be modified after geotechnical exploration and recommendations are received. The average road footprint width would be 47.6 feet; but would be wider than 60 feet in deep cut sections (approximately 10 percent of the alignment length). The road footprint width for the remainder (approximately 90 percent of the alignment length) would be between 30 and 60 feet. The total road footprint of new road construction would be 107 acres. The road would be constructed with both cuts and fills; cuts and fills have been balanced to the maximum extent practicable, based on ground surface data obtained from the National Aeronautics and Space Administration space shuttle. Formal geotechnical investigation and accurate ground surface data would be required to refine the cut/fill balance and road footprint. Fill sections would be constructed by placing geotextile fabric directly over existing tundra followed by placing and compacting fill materials. Proposed cut slopes have been flattened throughout to mitigate snow drifting (6 horizontal to 1 vertical).

The King Cove Access Road has the same design speed (20 mph), and similar cross section as the proposed road (Figure 2-8), except the top of the King Cove Access Road is a foot wider (14 feet). Outer Marker Road is a gravel surfaced road approximately 20-24 feet wide that traverses gently rolling terrain. Based on site inspection, the alignment, width, and sight distance appear adequate for a 25 mph travel speed. The road subgrade appears to be in good condition.

Based on reconnaissance level design, drainage structures would include 7 box culverts or small bridges to cross small streams. One bridge would cross over a large creek, and 154 cross culverts would be used for intermittent cross drainage where there are no streams. Cross culverts would be located as appropriate to maintain natural drainage patterns, and would typically be 24-inch in diameter, but could be sized larger if warranted by hydrologic calculations. Preliminary design of culverts was based on a 50-year storm event, and the peak runoff volumes were calculated using the Rational Method and Soil Conservation Service Hydrograph Method (Hayes and Young 2005; Woodward et al. n.d.). If the land exchange is approved, culverts would be designed for the 50-year storm event in final design (*Alaska Highway Preconstruction Manual*). Design of crossings over fish bearing streams must also follow guidelines given in the Alaska Department of Fish and Game/Alaska Department of Transportation and Public Facilities Memorandum of Agreement for the design, permitting, and construction of culverts for fish passage (ADF&G/ADOT&PF 2001), and Federal Highway Administration publications FHWA-HIF-11-008, FHWA-NHI-01-026, and FHWA-HIF-07-033 (FHWA 2010, 2005, 2007). Figure 2-9 provides 2 typical drainage structures that could be used for stream crossings. Table 2.4-3 provides preliminary information regarding the stream crossings, including stream system numbers assigned by the Alaska Department of Fish and Game.

Figure 2-8 Typical Roadway Section and Turnout Details

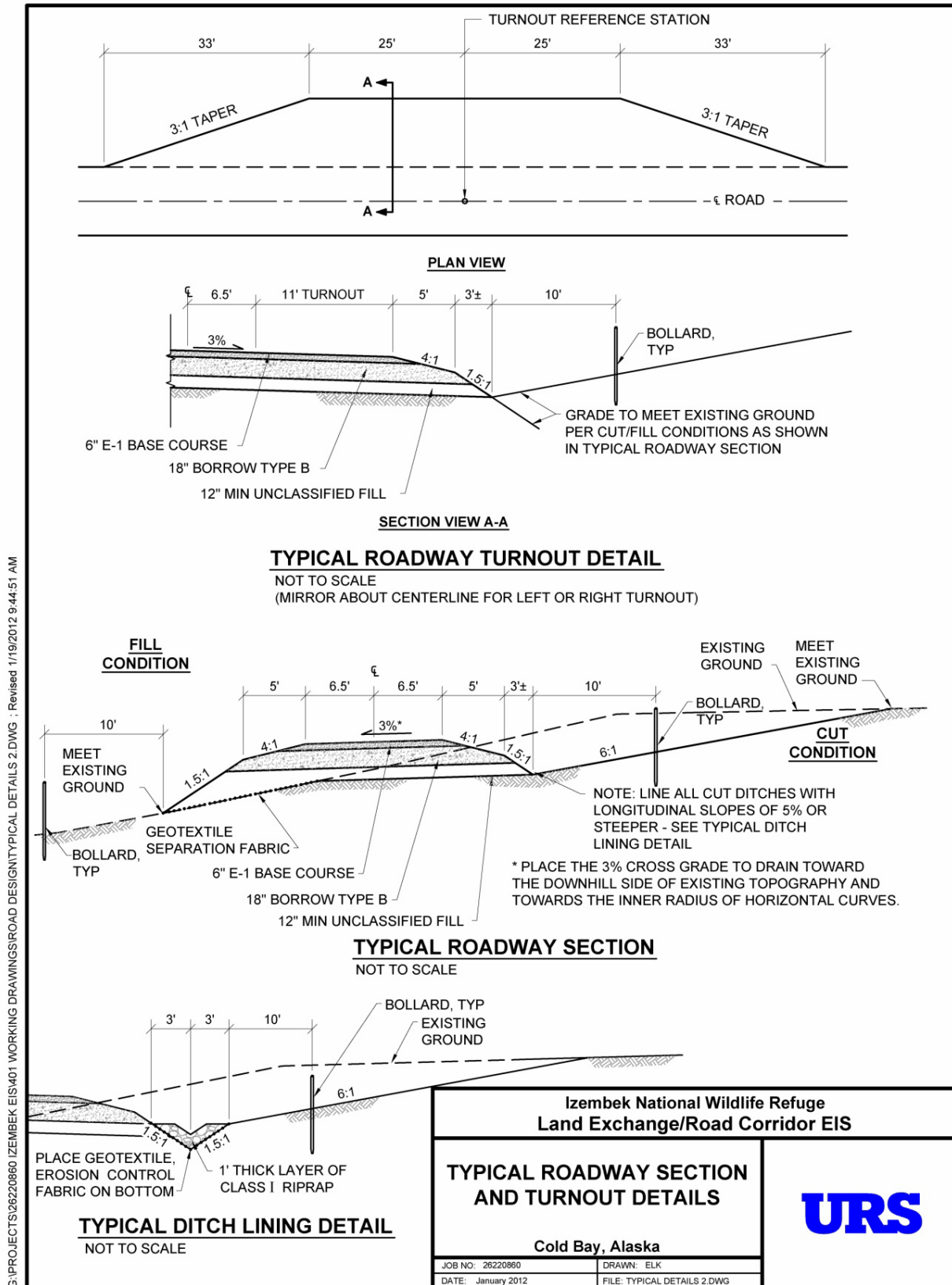


Figure 2-9 Typical Bridge and Box Culvert Details

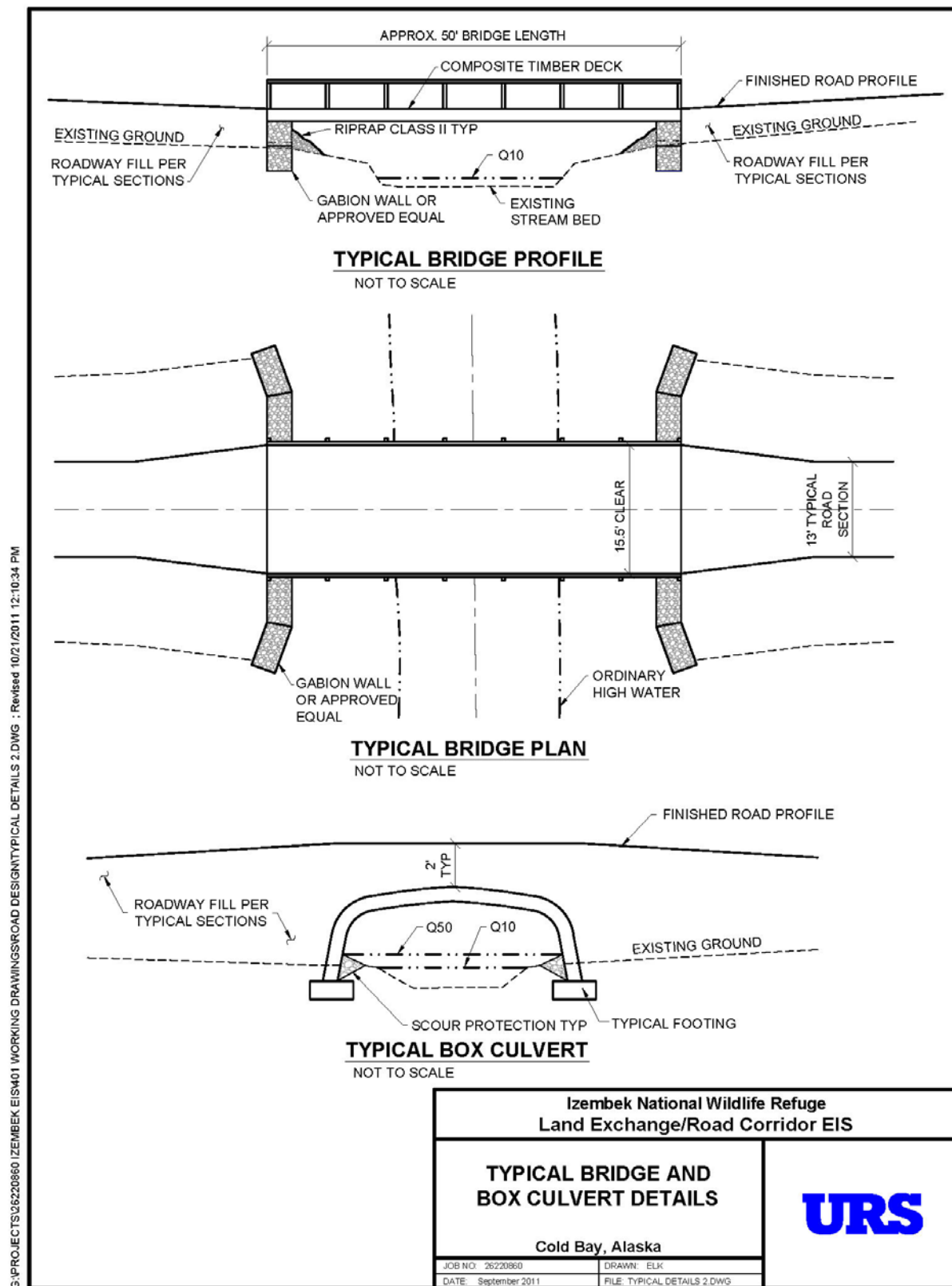


Table 2.4-3 Stream Crossings-Alternative 2 Southern Road Alignment

Road Location (Station)	Structure Type	Stream System #	Watershed Area (acres)	Q50 (cfs)	Q10 (cfs)	Span Length (in feet)	Slope (%)	Stream Footprint (acres)
142+80	Bridge	283-34-10700	7500	800	680	50	1	N/A
270+30	Box Culvert or Bridge	283-34-10600	620	150	61	30	0.6	0.01
385+50	Box Culvert or Bridge	Unnumbered	330	81	34	30	0.4	0.01
434+50	Box Culvert Bridge	283-34-10560	630	152	63	30	0.3	0.01
510+20	Box Culvert or Bridge	283-34-10500	730	175	74	30	1.1	0.01
535+20	Box Culvert or Bridge	283-34-10500-2031	805	192	81	30	0.3	0.01
591+50	Box Culvert or Bridge	283-34-10430	740	180	78	30	1	0.01
618+00	Box Culvert or Bridge	Unnumbered	360	90	38	30	10	0.01

Note:

Q50 = 50 year storm event estimated flow

Q10 = 10 year storm event estimated flow

cfs = cubic feet per second

Slope % = gradient of pipe, percent of drop per foot of pipe

Span lengths are preliminary and used for evaluation purposes only

Construction

Approximately 182,000 cubic yards of fill would be required for construction of the road. This material would be excavated from approximately 6 acres of land at the material site near the Northeast Terminal, located on King Cove Corporation lands. This material site is being used for the King Cove Access Road project, and expansion of that material site for this proposed road would require additional permitting and geotechnical exploration to verify adequate materials are available to complete the construction. If geotechnical investigations prove this site inadequate, other material site(s) may be required, and may be identified on private lands in the vicinity. The material required would include 29,000 cubic yards of crushed rock for road construction, and an additional 10,000 cubic yards would be processed and stockpiled at the material site for future road maintenance. An estimated 3.8 acres of wetlands would be filled with 20,000 to 25,000 cubic yards of material. The range of volumes is estimated in anticipation of settlement of the embankment where placed on softer ground. Geotextile material would be placed over existing tundra prior to placement of fill to help stabilize the embankment in soft areas.

An estimated 111,000 cubic yards of materials would be excavated from hilltops in the road corridor during project construction; useable material would be placed in the lower portion of the road embankment as shown in Figure 2-8. Unusable materials (organics and ash) are very thin on hilltops and ridges, and in some places non-existent. Unusable material would not be generated in low areas where road fill and geotextile fabric would be placed directly over the organic mat. Unusable materials would be stockpiled within the construction corridor for subsequent

placement on finished back slopes and abandoned sections of existing roads and trails. Large capacity construction vehicles that haul up to 20 cubic yard loads would likely be used on the project due to the large quantities of earth to be moved. These vehicles require a 12-foot wide operating width and the proposed final subgrade as currently designed would be approximately 24 feet wide. An efficient operation could necessitate construction of additional temporary widened areas between the permanent turnouts to allow for safe passing.

Temporary 0.5-acre construction-related barge landing sites would likely be required at the Northeast Terminal and Cross Wind Cove, placed immediately adjacent to existing hovercraft ramps. Approximately 600 cubic yards of fill would be required to develop each site; 100 cubic yards of temporary upland fill and 500 cubic yards of temporary clean rock fill would be located below the high tide line.

Construction would likely extend over 2 seasons. The construction would likely occur between May and November, with specific construction windows dictated by permit stipulations and mitigation requirements. Similar seasonal limitations on construction activity to mitigate impacts to wildlife were adopted as permit stipulations for construction of the road to the hovercraft terminal authorized by the 2003 EIS Record of Decision. Mitigation measures are identified in Chapter 4 and in Appendix F.

Quantities of water would be needed for embankment compaction and dust control. The road material should remain moist due to typically wet weather in the project area; therefore, water requirements would be relatively low. Water sources include 3 lakes and 1 creek. Locations and preliminary estimates of quantities are shown in Appendix E.

Construction of the alternative would require an estimated 30 construction and administration staff over the course of 2 construction seasons. Support facilities, including contractor job trailers and housing for personnel, cannot be staged on refuge lands. Possible staging sites for support facilities include the Northeast Terminal, Lenard Harbor, the City of King Cove, and the City of Cold Bay. The City of Cold Bay should be able to accommodate all the needed support facilities on the west end of the project, including camp facilities. The Northeast Terminal site on the east end of the project would be a likely location to place contractor job trailers, but limited space and amenities would probably require using the City of King Cove for staff housing, or using the City of Cold Bay for housing.

Operations and Maintenance

The project applicant, assumed to be the Alaska Department of Transportation and Public Facilities, would have management responsibility for road maintenance. Day-to-day maintenance would be provided by state resources or by local entities under a maintenance management agreement. The cost estimate assumes the Alaska Department of Transportation and Public Facilities would provide 100 percent of the road operation and maintenance, based out of the existing state operations and maintenance station in the City of Cold Bay. Four pieces of equipment would be needed to maintain the additional roads. Existing equipment in Cold Bay is funded by FAA. That equipment is dedicated to maintenance of the Cold Bay Airport and cannot be used to maintain the road. To take over the additional burden of road maintenance, the Alaska Department of Transportation and Public Facilities would need to purchase the additional equipment and hire one additional person for the Cold Bay maintenance station. Gravel for road maintenance would be required over the life of the project.

Cost

Preliminary estimates for road construction costs and materials acquisition are approximately \$1.1 million per mile for the proposed level of road standards, with a total project cost of \$21.7 million. Cost estimates were based in part on recent bid information provided by the Alaska Department of Transportation and Public Facilities for the King Cove Access Project. Four pieces of equipment needed to maintain the road would cost an additional \$1 million. The southern road alternative would have an estimated annual maintenance cost of \$670,000 per year, including maintenance costs for the 17.6 miles of road between the King Cove Airport and the Northeast Terminal. A 35-year life cycle was used for cost comparison with other alternatives. The road is expected to have a life of greater than 50 years. A total life cycle cost of \$ 34.2 million was estimated, represented in terms of net present value. A fee is not anticipated to be levied for use of the road.

Construction costs include final design, permitting, preparing the temporary barge landing sites, road construction, and the cost to construct a barrier system. Acquisition costs include an estimated 192,000 cubic yards of fill material, including 10,000 cubic yards for future maintenance. Gravel is expected to be excavated from the material site near the Northeast Terminal; the surface estate is owned by the King Cove Corporation and the subsurface estate is owned by the U.S. and managed as part of Izembek National Wildlife Refuge. Other nearby potential material sites on private land could also be used if this site is not sufficient for project needs. Estimates do not include costs for importing gravel to the site, if required.

2.4.3 Alternative 3 – Land Exchange and Central Road Alignment

Agencies consulted in the development of this alternative included the U.S. Geological Survey, National Park Service, Alaska Department of Natural Resources, Alaska Department of Fish and Game, the Service, Agdaagux Tribe of King Cove, Aleutians East Borough, and the City of King Cove. Table 2.4-2 provides a summary of Alternative 3 and comparison with Alternative 2.

Table 2.4-1 provides a comparison with all alternatives.

Alternative 3 proposes a land exchange between the federal government, State of Alaska, and King Cove Corporation, as described in the Proposed Action (Section 1.2). Legal descriptions for exchange parcels are provided in Appendix B and an overview of parcels proposed for exchange is presented in Section 2.4.6. The estimated amount of federal land exchanged in this alternative from Izembek National Wildlife Refuge would be 227 acres, including 152 acres in Izembek Wilderness, assuming a 100-foot corridor width. A constant 100-foot width was used for analysis purposes for this EIS; the final corridor width in the final land exchange documents would have a similar footprint area but would have a variable width, with an average of 100 feet. The variable width would adapt to constraints defined by more detailed engineering, based on a more in depth geotechnical investigation and acquisition of more refined ground surface data.

Under this alternative, the Service would execute an administrative boundary adjustment in the vicinity of Blinn Lake, in accord with ANILCA Section 103(b). An area that is currently designated as Alaska Peninsula National Wildlife Refuge, but administered by Izembek National Wildlife Refuge, would become part of Izembek National Wildlife Refuge (see Figure 2-6).

The central road alignment (Figure 2-3) would originate at the terminus of the King Cove Access Road (currently under construction) in the vicinity of the Northeast Terminal. The initial 6 miles would be co-located with the southern alignment (Alternative 2). The alignment would cross 2 fish bearing streams. At a point 6 miles north of the Northeast Terminal, the central alignment would depart from the southern alignment and wind north and then westerly through steep hills and around lakes of the isthmus divide to Outpost Trail. The alignment would be co-located with the southern alignment, along Outpost Trail (which transitions to Outpost Road) to an intersection north of Blinn Lake. The central alignment would depart from the southern alignment north of Blinn Lake, continuing along Outpost Road to intersect with Outer Marker Road to the west of Blinn Lake. The route would continue south along Outer Marker Road to intersect with St. Louis Road, terminating at the refuge/state boundary.

The central alignment would be located in the watersheds of Izembek and Kinzarof lagoons. The alignment was designed to avoid or minimize impacts to wetlands and high value habitat for breeding, nesting, and migrating waterbirds, to reduce disturbance or impacts to species and habitat in both Izembek and Kinzarof lagoons, while also considering land mammal (caribou, bear, furbearers) movement and habitat use of the isthmus. This alignment seeks to minimize impacts to wetlands and lake-dependent resources, avoid or minimize stream crossings, and to accommodate terrain considerations.

The comparisons of Alternatives 2 and 3, including the number and type of drainage structures, fill quantities, and typical roadway sections and design details presented in tables and figures, are estimates calculated for analysis purposes. Final project design and construction details may be different.

Components

Alternative 3 consists of the following major components:

- Land exchange between the federal government, the State of Alaska, and the King Cove Corporation for the purpose of constructing a road between the City of King Cove and Cold Bay Airport (227 acres of federal land included in exchange from Izembek National Wildlife Refuge and Alaska Peninsula National Wildlife Refuge, and other parcels as outlined in Table 2.4-6 and Appendix B).
- Construction of 20.0 miles of a single lane gravel road from the Northeast Terminal to Outer Marker Road; approximately 9.0 miles of road would include existing roads and trails, of which 8 miles would be reconstructed. The 1-mile section farthest south (near Outer Marker Road) is in fair condition and would be rehabilitated rather than completely reconstructed. Approximately 11 miles of road would be on land where there has not previously been a road. An additional 1.6 miles along the existing Outer Marker Road and St. Louis Road would complete the land exchange corridor; no road construction or reconstruction would be required on this segment of the exchange parcel.
- The exchange parcel for the road corridor would include the federal lands from the Izembek National Wildlife Refuge boundary on the east side of the proposed road corridor to the boundary with state lands on the west side of the proposed alignment. The proposed exchange parcel is estimated to be 21.6 miles long, an average of 100 feet wide, and contain 227 acres. The exchange parcel for the road corridor would not include the private lands owned by King Cove Corporation between the Northeast Terminal northward to the existing boundary with Izembek National Wildlife Refuge and Izembek Wilderness.
- A barrier installed along the length of the roadway on both sides, as specified in the Act, to prevent vehicles from accessing the Izembek National Wildlife Refuge and Izembek Wilderness lands adjacent to the road. Two barrier types are being analyzed for this project: a chain barrier and a bollard barrier, as illustrated in Figure 2-7.
- Approximately 173 drainage structures would be required, including 1 bridge, 1 box culvert or small bridge, and 171 cross culverts.
- One or more material sites and 2 temporary barge landing sites/staging areas are anticipated for use in road construction. The barge landing sites would be located at the Northeast Terminal and Cross Wind Cove hovercraft sites, placed immediately adjacent to existing hovercraft ramps. Barge landings would have an area of 0.5 acres, with a larger staging area located on adjacent uplands, at the Northeast Terminal and City of Cold Bay.
- A material site was developed near the Northeast Terminal for the King Cove Access project, and expansion of that material site for the proposed road would require additional permitting and geotechnical exploration to verify adequate materials are available. It is likely additional gravel sites could be developed to the northeast of the existing gravel pit site near the Northeast Terminal, based on observations of road cut banks and probing efforts during the site visit. Existence of suitable gravel quality and quantities at these sites would have to be verified by a geotechnical investigation prior to final design for construction, if the land exchange is approved. These sites are on King Cove Corporation

lands and could likely be permitted for gravel extraction if a geotechnical investigation verifies suitable quality materials. Two material sites on the west side of Cold Bay include Blue Bill pit, owned and operated by the Service, and the Johnnie pit, operated by the Federal Aviation Administration. Gravel materials from those sites have a high sand content, limited remaining usable gravel deposits, and would not be available for this project because the materials are committed to maintenance requirements for the Federal Aviation Administration and the Service. No other viable material source was identified in Cold Bay. Other possible material sites could include the Lenard Harbor quarry site, which would require additional permitting, and a quarry at Sand Point owned by Shumagin Corporation. The Sand Point material would have to be barged to Cold Bay, which could add \$2 to \$3 million to the cost to construct the road. Organic materials would be stockpiled within the construction corridor for subsequent placement on finished back slopes and abandoned sections of existing roads and trails.

Ownership of Project Lands

Alternative 3 would include a land exchange, as proposed in the Act and described in the proposed action (Section 1.2) and legal description of parcels (Appendix B). An overview of parcels proposed for exchange is also presented in Section 2.4.6.

In summary, the land exchange would be very similar to that described for Alternative 2, though the location of the isthmus parcel of lands exchanged by the Service would be shifted to the north. The federal government would convey to the State an estimated 227 acres for a corridor through the Izembek National Wildlife Refuge, which includes 152 acres in Izembek Wilderness. As previously stated, the Service would execute a boundary adjustment between Izembek and Alaska Peninsula National Wildlife Refuge, in accord with ANILCA Section 103(b) (Figure 2-6). The federal government would also convey to the State the parcel on Sitkinak Island (1,619 acres). Refer to Appendix B for additional information regarding proposed parcels for exchange and a potential delay in conveyance of a portion of the Sitkinak Island parcel, pending contaminated site remediation.

The State would convey the parcels adjacent to the North Creek Unit of the Alaska Peninsula National Wildlife Refuge to the Service (41,887 acres), which would become designated Wilderness under the terms of the Act. This conveyance would include title to the subsurface estate but the State of Alaska would retain ownership of submerged lands including those beneath tidelands and certain lakes, rivers, and streams. (Refer to Figure 1-1 for general locations of proposed exchange parcels or Table 2.4-6 and Appendix B for specific proposed exchange parcels.)

Upon completion of the land exchange, Izembek State Game Refuge would also include state lands and water in the vicinity of Kinzarof Lagoon, in accord with the *Izembek State Game Refuge Land Exchange Bill*.

King Cove Corporation would convey to the Service the parcels in the vicinity of Kinzarof Lagoon and Mortensens Lagoon (10,696 acres). The Corporation would also relinquish the selection of a parcel in Izembek Wilderness (5,430 acres) and a substitute parcel would be selected in Alaska Peninsula National Wildlife Refuge. The Kinzarof Lagoon parcel (2,604 acres) would become designated wilderness under the terms of the Act.

A section of the Alternative 3 routing following Outer Marker Road passes through a 22.95 acre parcel of private land (Figure 2-6). The fee title to the parcel was transferred in 1971 by the Federal Aviation Administration to RCA Alaska Communications, Inc. under authority created in Public Law 90-135, 40 USC 771-792. The deed transferring ownership reserves to “the Government the right to use, maintain and operate the VORTAC [Very High Frequency Omni-Directional Radio Range Tactical Air Navigation Aid] access road, as constructed and located, across said premises.” Authorization for use of the road other than that reserved to the U.S. as stated above would have to be obtained from the current owner of the parcel.

Design Criteria

Design guidance was based on the American Association of State Highway and Transportation Officials *Policy on Geometric Design of Highways and Streets* (“Green Book”) and *Guidelines for Geometric Design of Very Low Volume Roads* (AASHTO 2001, 2004), and the Alaska Department of Transportation and Public Facilities *Alaska Highway Pre-Construction Manual* (ADOT&PF 2005). The road alignment presented in this alternative was developed to a 35 percent design level. Consistent with this level of design, a centerline survey, geotechnical investigations, or other detailed site surveys have not been completed.

Two-way single lane roads can be used in areas where traffic is less than 50 vehicles a day. The average daily traffic estimate provided in the 2003 EIS of 35 was used for design standards. Even though that projection included some commercial traffic that would not be a part of the current alternatives, it is still below maximum traffic considered for a single lane road. The low-volume guidelines (AASHTO 2001, 2004) apply to roads with equal to or less than 400 vehicles a day.

The *Guidelines for Geometric Design of Very Low Volume Roads* recommends a width between 11 feet and 13 feet for a single lane two-way road. The guidelines require a minimum travel lane width of 9 feet, and the *Alaska Highway Pre-Construction Manual* requires a minimum 7-foot clear zone (obstruction free zone for safety) on each side of the travel lane. The proposed width for the central road alternative would be 13 feet, which would include a 9-foot travel lane and 2-foot shoulders on each side. The 2-foot shoulders combined with the 5-foot wide foreslope (see Figure 2-8) would fulfill the requirement of the 7-foot clear zone. Maximum road grades would be limited to 12 percent in accord with the American Association of State Highway and Transportation Officials guidelines. Grades over 9 percent would be limited to short distances, which would occur in an estimated 0.6 miles out of the total 20.0 mile length of road construction.

The 20.0 miles of single lane gravel road would be constructed with an estimated 158 inter-visible turnouts for passing. Each turnout would be a 50-foot long by 11-foot wide gravel surface parallel to the traffic lane. Turnouts would be placed with a maximum spacing of 900 feet, or closer to ensure inter-visibility between turnouts. The typical section is shown in Figure 2-8 and would be the same as described for the southern road alignment alternative. The average road footprint width would be 41.4 feet, but would be 60 feet or wider in deep cut sections (approximately 10 percent of the alignment length). The road footprint width for the remainder (approximately 90 percent of the alignment length) would be between 30 and 60 feet. The total road footprint of new road construction would be 100 acres. The road would be constructed with both cuts and fills; cuts and fills have been balanced to the maximum extent practicable, based on ground surface data obtained from the National Aeronautics and Space Administration space

shuttle. Formal geotechnical investigation and accurate ground surface data would be required to refine the cut/fill balance and road footprint. Fill sections would be constructed by placing geotextile fabric directly over existing tundra followed by placing and compacting fill materials. Proposed cut slopes have been flattened throughout to mitigate snow drifting (6 horizontal to 1 vertical).

The King Cove Access Road has the same design speed (20 mph), and similar cross section as the proposed road (Figure 2-8), except the top of the King Cove Access Road is a foot wider (14 feet). Outer Marker Road is a gravel surfaced road approximately 20-24 feet wide that traverses gently rolling terrain. Based on site inspection, the alignment, width, and sight distance appear adequate for a 25 mph travel speed. The road subgrade appears to be in good condition. .

Based on reconnaissance level design, drainage structures would include 1 box culvert or small bridge over 1 small stream, 1 bridge, and 171 cross culverts for intermittent cross drainage where there are no streams. Cross culverts would be located as appropriate to maintain natural drainage patterns, and would typically be 24-inch diameter, but could be sized larger if warranted by hydrologic calculations. Preliminary design of culverts was based on a 50-year storm event, and the peak runoff volumes were calculated using the Rational Method and Soil Conservation Service Hydrograph Method (Hayes and Young 2005; Woodward et al. n.d.). If the land exchange is approved, culverts would be designed for the 50-year storm event in final design (*Alaska Highway Preconstruction Manual*). Design of crossings over fish bearing streams must also follow guidelines given in the Alaska Department of Fish and Game/Alaska Department of Transportation and Public Facilities Memorandum of Agreement for the design, permitting, and construction of culverts for fish passage (ADF&G/ADOT&PF 2001), and Federal Highway Administration publications FHWA-HIF-11-008, FHWA-NHI-01-020, and FHWA-HIF-07-033 (FHWA 2010, 2005, 2007). Figure 2-9 provides 2 typical drainage structures that could be used for stream crossings. Table 2.4-4 provides preliminary information regarding the stream crossings, including stream system numbers assigned by the Alaska Department of Fish and Game.

Table 2.4-4 Stream Crossings-Alternative 3 Central Road Alignment

Road Location (Station)	Structure Type	Stream System #	Watershed Area (acres)	Q50 (cfs)	Q10 (cfs)	Span Length (in Feet)	Slope (%)	Stream Footprint (acres)
142+80	Bridge	283-34-10700	7500	800	680	50	1	N/A
270+30	Box Culvert or Bridge	283-34-10600	620	150	61	30	0.6	0.01

Note:

Q50 = 50 year storm event estimated flow

cfs = cubic feet per second

Q10 = 10 year storm event estimated flow

Slope % = gradient of pipe, percent of drop per foot of pipe

Span lengths are preliminary and used for evaluation purposes only.

Construction

Approximately 231,000 cubic yards of fill would be required for construction of the road. This material would be excavated from approximately 7 acres of land at the material site near the Northeast Terminal, located on King Cove Corporation lands. This material site is being used for the King Cove Access Road project, and expansion of that material site for this proposed road

would require additional permitting and geotechnical exploration to verify adequate materials are available to complete the construction. If geotechnical investigations prove this site inadequate, other material site(s) may be identified on private lands in the vicinity. The material required would include approximately 32,000 cubic yards of crushed rock for road construction, and an additional 10,000 cubic yards would be excavated and stockpiled at the site for future road maintenance. An estimated 2.4 acres of wetlands would be filled with 11,000 to 15,000 cubic yards of material. The range of volumes is estimated in anticipation of settlement of the embankment where placed on softer ground. Geotextile material would be placed over existing tundra prior to placement of fill to help stabilize the embankment in soft areas.

An estimated 99,000 cubic yards of materials would be excavated in project construction; useable material would be placed in the lower portion of the road embankment as shown in Figure 2-8. Unusable materials (organics and ash) are very thin on hilltops and ridges, and in some places non-existent. Unusable material would not be generated in low areas where road fill and geotextile fabric would be placed directly over the organic mat. Unusable materials would be stockpiled within the construction corridor for subsequent placement on finished back slopes and abandoned sections of existing roads and trails. Large capacity construction vehicles that haul up to 20 cubic yard loads would likely be used on the project due to the large quantities of earth to be moved. These vehicles require a 12-foot wide operating width and the proposed final subgrade as currently designed would be approximately 24 feet wide. An efficient operation could necessitate construction of additional temporary widened areas between the permanent turnouts to allow for safe passing.

Temporary 0.5 acre construction-related barge landing sites would likely be required at the Northeast Terminal and Cross Wind Cove, placed immediately adjacent to existing hovercraft ramps. Approximately 600 cubic yards of fill would be required to develop each site; 100 cubic yards of temporary upland fill and 500 cubic yards of temporary clean rock fill would be located below the high tide line.

Construction would likely extend over 2 seasons. The construction likely would occur between May and November, with specific construction windows dictated by permit stipulations and mitigation requirements. Similar seasonal limitations on construction activity to mitigate impacts to waterfowl were adopted as permit stipulations for construction of the road to the hovercraft terminal authorized in the 2003 EIS. Mitigation measures are identified in Chapter 4 and in Appendix F.

Quantities of water would be needed for embankment compaction and dust control. The road material should remain moist due to typically wet weather in the project area; therefore, water requirements would be relatively low. Water sources include 2 lakes and 1 creek. Locations and preliminary estimates of quantities are shown in Appendix E.

Construction of the alternative would require an estimated 30 construction and administration staff over the course of 2 construction seasons. Support facilities that would include contractor job trailers and housing for personnel cannot be staged on refuge lands. Possible staging sites for support facilities include the Northeast Terminal, Lenard Harbor, the City of King Cove, and the City of Cold Bay. The City of Cold Bay should be able to accommodate all the needed support facilities on the west end of the project, including camp facilities. The Northeast Terminal site on the east end of the project would be a likely location to place contractor job trailers, but

limited space and amenities would probably require using the City of King Cove for staff housing, or using the City of Cold Bay for housing.

Operations and Maintenance

The project applicant, assumed to be the Alaska Department of Transportation and Public Facilities, would have management responsibility for road maintenance. Day-to-day maintenance would be provided by state resources or by local entities under a maintenance management agreement. The cost estimate assumes the Alaska Department of Transportation and Public Facilities would provide 100 percent of the maintenance, based out of the existing state operations and maintenance station in the City of Cold Bay. Four pieces of equipment would be needed to maintain the additional roads. Existing equipment in Cold Bay is funded by FAA. That equipment is dedicated to maintenance of the Cold Bay Airport and cannot be used to maintain the road. To take over the additional burden of road maintenance, the Alaska Department of Transportation and Public Facilities would need to purchase the additional equipment and hire one additional person for the Cold Bay maintenance station. Gravel for road maintenance would be required over the life of the project.

Cost

Preliminary estimates for road construction and acquisition would be similar to Alternative 2, with only the length of the road varying. Road construction costs are approximately \$1.1 million per mile for the proposed level of road standards, with a total project cost of \$22.7 million. Cost estimates were based in part on recent bid information provided by Alaska Department of Transportation and Public Facilities for the King Cove Access Project. Four pieces of equipment needed to maintain the road would cost an additional \$1million. The central road alternative would have an estimated annual maintenance cost of \$710,000 per year, including maintenance costs for 17.6 miles of road between the King Cove Airport and the Northeast Terminal. A 35-year life cycle was used for cost comparison with other alternatives. The road is expected to have a life of greater than 50 years. A total life cycle cost of \$37.0 million was estimated, represented in terms of net present value. A fee is not anticipated to be levied for use of the road.

Construction costs include final design, permitting, preparing temporary barge landing sites, road construction, and the cost to construct a barrier system. Acquisition costs include an estimated 241,000 cubic yards of fill material, including 10,000 cubic yards for future maintenance. Gravel is expected to be excavated from the material site near the Northeast Terminal; the surface estate is owned by the King Cove Corporation and the subsurface estate is owned by the U.S. and managed as part of Izembek National Wildlife Refuge. Other nearby potential material sites on private land could also be used if this site is not sufficient for project needs. Estimates do not include costs for importing gravel to the site, if required.

2.4.4 Alternative 4 – Hovercraft Operations from the Northeast Terminal to Cross Wind Cove (Six days per week)

Alternative 4 (see Figure 2-10) is the Proposed Action in the 2003 EIS. This alternative, as proposed in the 2003 EIS, has not been fully implemented to date. However, actions authorized by the Record of Decision are ongoing. Continued activities for development of the access road and the Northeast Terminal were contracted for construction in 2011 and are under construction. The alternative considered in this EIS assumes construction as originally contracted; implementation of the alternative would not require further construction. The alternative will consider operations of the hovercraft, as described in the 2003 EIS, for service 6 days per week between the Northeast Terminal and the Cross Wind Cove. It is acknowledged that the Aleutians East Borough has indicated it will not resume hovercraft service; Alternative 4 does not assume that the Aleutians East Borough would be the operator of this alternative. However, Alternative 4 is retained for analysis, as described in the 2003 EIS.

Table 2.4-1 provides a summary of Alternative 4 and a comparison with other alternatives. This alternative would not include a land exchange.

Components

This alternative would use the existing hovercraft terminal at Cross Wind Cove. The terminal building installed at Lenard Harbor would remain in place, but some materials, including planking, timber mats, generators, and cargo containers (Conex containers) would be re-purposed and installed at the new terminal site. The contract for construction of the access road and Northeast Terminal was established in 2011. These activities were analyzed in the 2003 EIS and no additional ground disturbing activities would be required beyond what was identified in the 2003 EIS. Costs for a hovercraft similar to the Aleutians East Borough hovercraft, Suna X, are included in this analysis.

Ownership of Project Lands

Alternative 4 would be located on lands owned by King Cove Corporation and the State of Alaska.

King Cove Corporation owns the surface estate of lands associated with hovercraft facilities and operations on the east side of Cold Bay. Subsurface estate would not be affected. These lands are located within the boundaries of the Izembek National Wildlife Refuge, but are private lands.

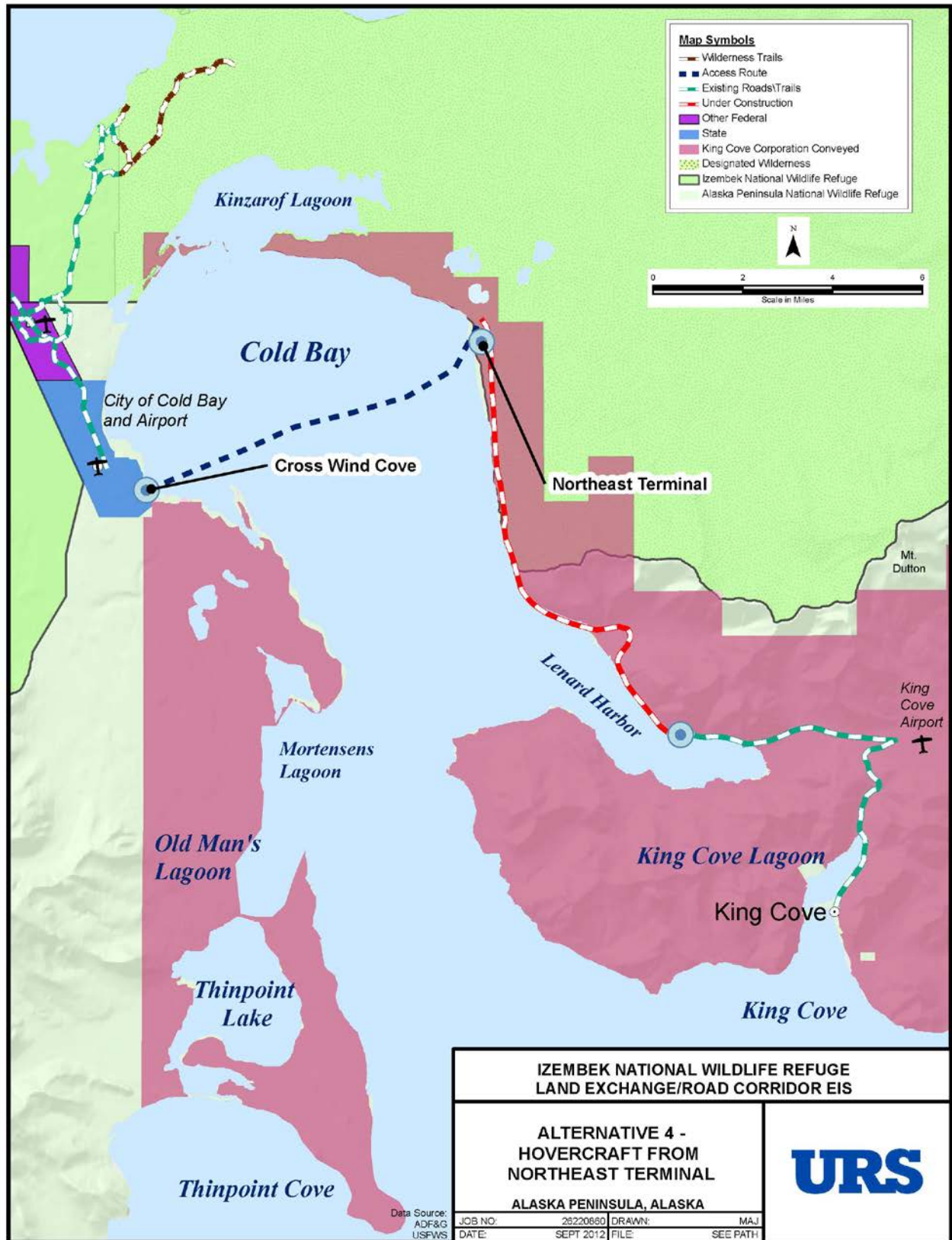
The State of Alaska owns the surface estate of lands associated with hovercraft facilities and operations on the west side of Cold Bay and the tidelands and submerged lands (below mean high tide) in the vicinity of the hovercraft facilities on the east and west sides of Cold Bay. The subsurface estate would not be affected. The Cross Wind Cove facilities are within the boundaries of the Alaska Peninsula National Wildlife Refuge, but are state lands.

The project would not directly encumber surface or subsurface estates of federal lands, including Izembek Wilderness. The lands selected by King Cove Corporation within Izembek Wilderness could eventually be transferred to the corporation.

A federal right of way would not be required for any of the facilities proposed in this alternative.

No land exchange is proposed under this alternative.

2.4.4 Alternative 4 – Hovercraft Operations from the Northeast Terminal to Cross Wind Cove (Six days per week)

Figure 2-10 Alternative 4 (Hovercraft from Northeast Terminal)

Construction

Facilities required for the hovercraft operations and the associated access roads were authorized under the 2003 EIS Record of Decision and subsequent permits. This alternative would not require additional facilities or ground disturbing activities beyond what was authorized in the 2003 EIS and associated permits issued for the project. However, upon notification that the Aleutians East Borough had discontinued hovercraft service (as part of the No Action alternative), the Alaska Department of Transportation and Public Facilities canceled the planned construction of the hovercraft building, or hangar, at the Northeast Terminal site. Other infrastructure to support operation of an alternative landing craft marine link is under construction (see Section 2.2.4.2 for details). As result, the only additional construction required to implement this alternative would be a new hovercraft building or hangar at the Northeast Terminal, as described in the 2003 EIS.

Operations and Maintenance

Under the scenario authorized in the 2003 EIS Record of Decision, hovercraft service would include 1 round trip per day, 6 days per week, throughout the year. The trip would originate at the Northeast Terminal, with service to Cross Wind Cove on the west side of Cold Bay. The hovercraft would be available for emergency medical evacuations 24 hours per day, 7 days per week.

Operations and maintenance considered in this EIS incorporates the proposal from the 2003 EIS (Section 2.1.8). The access road would be maintained by the Aleutians East Borough for daily use, including signage, regular grading, and snow removal. For cost estimating, it is assumed the Aleutians East Borough would purchase additional equipment and hire additional maintenance staff to maintain the road between the King Cove Airport and the Northeast Terminal. Road grading is estimated to require 8,000 to 10,000 cubic yards of crushed rock in the first 5 to 10 years, with an ongoing need for gravel for road maintenance over the life of the project.

The hovercraft terminals would be operated and maintained to accommodate passengers and freight, including terminal maintenance, pad maintenance, and snow removal. Bulk fuel storage would be as envisioned in the 2003 EIS, with 2 storage tanks, a fueling system, and a 35 kilowatt diesel generator. The hovercraft would be subject to icing on winter days when temperatures are below freezing. It is assumed the hovercraft would be equipped with a spray skirt to reduce spray and deicing boots would be installed on the propellers to reduce ice build-up. It is also assumed the hovercraft would park inside a shelter at the Northeast Terminal following each trip and the shelter would be heated to allow immediate deicing of the hovercraft.

The 6 days per week operating schedule, with 1 round trip per day, would generate an estimated 246 hours of service annually. The maintenance schedule proposed is reflected in the 2003 EIS (Section 2.1.8).

Cost

Estimated upfront capital costs include \$9 million to purchase a new hovercraft, \$1.4 million for additional deicing modifications, \$250,000 for shipping, and \$300,000 to construct a heated hovercraft terminal at the Northeast Terminal.

2.4.4 Alternative 4 – Hovercraft Operations from the Northeast Terminal to Cross Wind Cove (Six days per week)

The 2003 EIS estimated annual operating costs would be \$870,000 for 1 round trip, 6 days per week service. Actual hovercraft operating costs from Lenard Harbor for 3 days per week service (in 2010) were over \$1,000,000 per year. The round trip fare was estimated in the 2003 EIS to be from \$115 to \$198 per person, with a projected volume of 3,500 passengers per year.

Based on the historic actual costs and revenues for operation from the Lenard Harbor terminal, and adjusted for the shorter distances to be traveled from the Northeast Terminal, annual operating costs would be about \$2.4 million.

Since the road is presently under construction, costs for construction of the access road are not included in this analysis. However, the annual operating and maintenance cost does include approximately \$320,000 per year for maintenance of 17.6 miles of road between the King Cove Airport and the Northeast Terminal. Maintenance costs are based on a cost estimate of \$18,000 per lane mile per year for the Cold Bay region, based on a conversation with Alaska Department of Transportation and Public Facilities (Maintenance and Operations). The estimate assumes the purchase of new equipment and hiring of new staff. The life cycle cost over 35 years for this alternative would be \$52.8 million, expressed in net present value.

2.4.5 Alternative 5 – Lenard Harbor Ferry with Cold Bay Dock Improvements

Alternative 5 would use a ferry to travel 14 miles between a terminal in Lenard Harbor and a substantially modified Cold Bay dock (see Figure 2-11). This alternative is similar to an alternative that was analyzed in the 2003 EIS, with the exception of project elements that have been permitted or constructed to date, including the access road to the site, a terminal building with associated utility infrastructure, and a parking area. However, the Lenard Harbor terminal structure has been damaged by a storm, and would have to be replaced. Upgrades to the parking area and security fencing would also be necessary. Ferry service would be provided 6 days per week.

Table 2.4-5 provides a summary of Alternative 5 and Table 2.4-1 compares all alternatives. This alternative would not include a land exchange.

Components

Alternative 5 consists of the following major components:

- Lenard Harbor ferry dock, new terminal building, security fencing, and parking lot grading
- Major modification of the existing Cold Bay dock by adding a wave barrier, vehicle ramp system for on- and off-loading vehicles at water level, and a pedestrian walkway
- A displacement monohull, open deck ferry with ice-breaking capabilities
- One material site, 1 disposal site for unusable excavated materials, and 1 temporary barge landing site/staging area required for construction

Ownership of Project Lands

Alternative 5 would be located on lands owned by King Cove Corporation, The Aleut Corporation, and the State of Alaska.

King Cove Corporation owns the surface estate and The Aleut Corporation owns the subsurface estate of lands required to accommodate implementation of Alternative 5, including the material site, waste disposal site, and the temporary barge landing site/staging area. These sites would be a subset of those identified for the Lenard Harbor Ferry alternative in the 2003 EIS, and would include less than 2 acres of land (Table 2.4-5). The King Cove Corporation lands are located within the boundaries of the Alaska Peninsula National Wildlife Refuge, but are private lands.

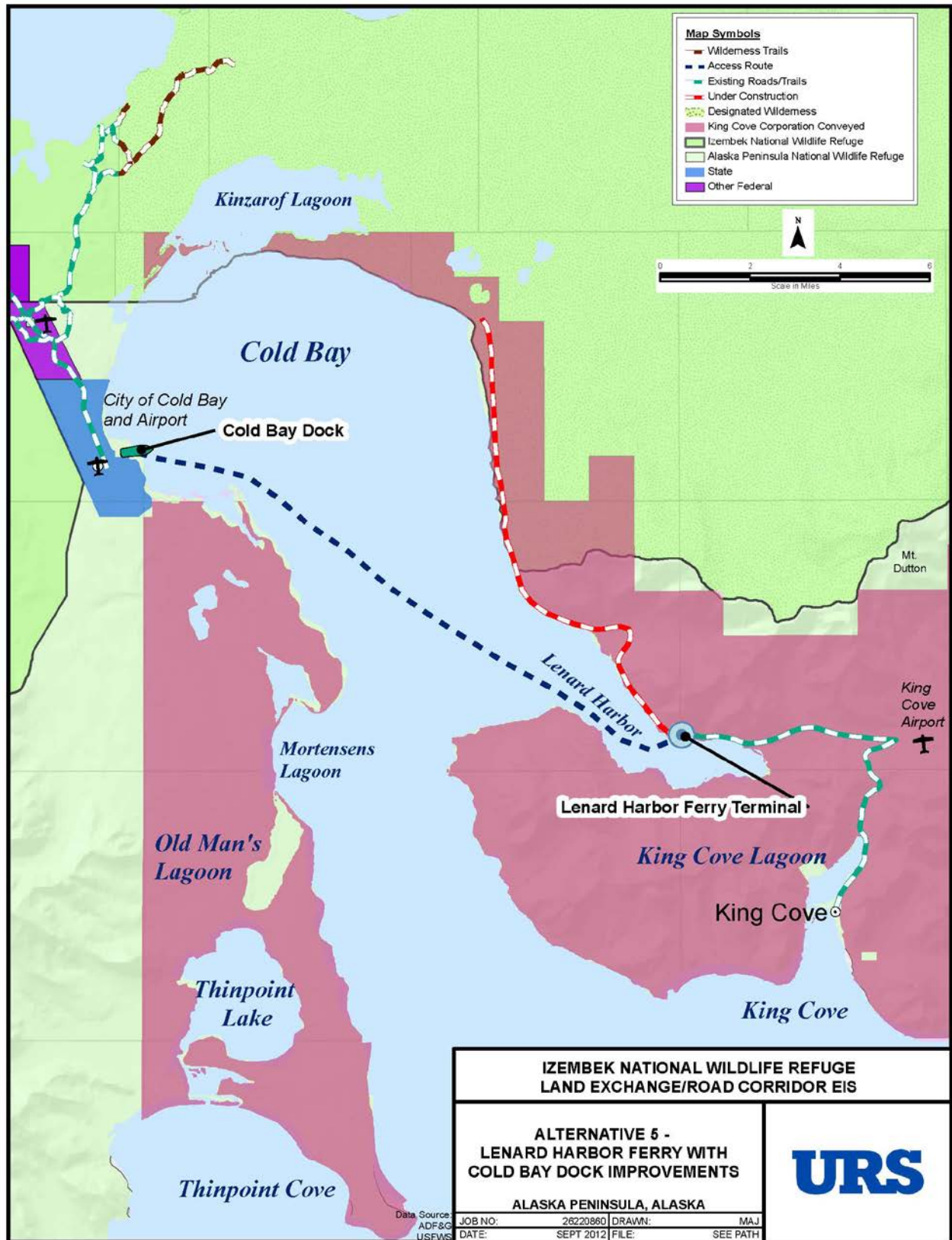
The State of Alaska owns the surface and subsurface estate of project lands located below mean high water.

The project would not directly encumber surface or subsurface estates of federal lands, including Izembek Wilderness. The lands selected by King Cove Corporation within Izembek Wilderness could eventually be transferred to the corporation.

A federal right of way would not be required for any of the facilities proposed in this alternative.

No land exchange is proposed under this alternative.

Figure 2-11 Alternative 5 (Lenard Harbor Ferry with Cold Bay Dock Improvements)



**Table 2.4-5 Summary of Alternative 5: Lenard Harbor Ferry
with Cold Bay Dock Improvements**

	Alternative 5: Lenard Harbor Ferry with Cold Bay Dock Improvements
Lenard Harbor Ferry Terminal	
Footprint in Acres for Ferry Ramp and Riprap Armor (Previously disturbed area)	0.5
Acres Above High Tide Line	0.4
Acres Below High Tide Line	0.2
Acres Below Mean High Water	0.1
Acres Below Mean Low Low Water	Less than 0.1 acre
Excavation Required for Ramp Construction in Cubic Yards	5,000
Fill Required for Ramp Construction in Cubic Yards	3,150
Quantity of Borrow Material in Cubic Yards	250
Riprap in Cubic Yards	2,800
Quantity of Riprap in Cubic Yards Placed in U.S. waters, including wetlands	1,250
Quantity of Riprap in Cubic Yards Placed Below High Tide Line	1,250
Quantity of Riprap in Cubic Yards Placed Below Mean High Water	1,050
Quantity of Riprap in Cubic Yards Placed Below Mean Low Low Water	600
Modifications to Cold Bay Dock	
New Footprint in Acres	0.6
Vehicle Turnaround in Acres	Less than 0.1 acre
Pedestrian Walkway in Acres	0.4
Float and Access Ramps in Acres	Less than 0.1 acre
Small Craft Float in Acres	Less than 0.1 acre
New Fill Required	0
New Excavation Required	0
Lenard Harbor Material Site	
New Footprint in Acres for Rock Excavation	Less than 0.1 acre
Total Fill in Cubic Yards	0
Total Excavation in Cubic Yards	3,150
Quantity of Borrow Material in Cubic Yards	250
Quantity of Armor Stone/Riprap in Cubic Yards	2,800
Quantity of Unusable Material Excavated in Cubic Yards	100
Acres of Wetlands Potentially Excavated	0.1
Quantity of Material Potentially Excavated from Wetlands in Cubic Yards	80
Waste Material Disposal	
New Footprint in Acres for Waste Material Disposal in Lenard Harbor Material Site	0.6
Total Quantity of Unusable Materials for Disposal in Cubic Yards	5,500

	Alternative 5: Lenard Harbor Ferry with Cold Bay Dock Improvements
Temporary Barge Landings and Staging Areas	
New Footprint in Acres for Rock Ramp (12 feet by 120 feet)	0.1
Acres Below High Tide Line	Less than 0.1 acre
Acres Above High Tide Line (not within footprint of permanent facility)	Less than 0.1 acre
Quantity of Total Fill in Cubic Yards	620
Quantity of Temporary Upland Fill in Cubic Yards	60
Quantity of Temporary Clean Rock Fill Below High Tide Line in Cubic Yards	560
Quantity of Fill Below Mean High Water in Cubic Yards	1,000
Quantity of Fill Below Mean Low Low Water in Cubic Yards	0
Generalized Ferry Specifications (vessel not selected)	
<ul style="list-style-type: none"> • Length 100 to 150 feet • Beam up to 38 feet • Draft up to 13 feet • Service speed up to 10 knots • Accommodate up to 150 passengers, 19 passenger vehicles, and 2 large trucks • Open deck/bow-stern ramp for loading/unloading • Displacement up to 1,000 long tons • Break horsepower at prop up to 1,200 • Ice-breaking capabilities 	

Construction

The key elements for construction include the Lenard Harbor ferry terminal, modifications to the Cold Bay dock, sites to support construction, and acquisition of the vessel. The construction period was estimated at 1 to 2 years (USACE 2003).

Lenard Harbor Ferry Terminal. The site would be accessed via an existing road to the site (presently occupied by the Lenard Harbor hovercraft terminal). Facilities at the site would consist of a 34-foot by 40-foot skid-mounted building (for an office and public waiting room), potable water and septic system, and a ramp between the shore and the ferry dock. These facilities would be the same as described and depicted in the 2003 EIS; this EIS does not consider elements already constructed as part of this alternative. The parking area and pad for a replacement terminal building are already in place. Additional improvements would be replacement of the building, parking area re-grading, and security fencing around the site.

The 2003 EIS (Section 2.4.2) describes the dock facilities:

Water with a depth of -20 feet at mean low water is within 100 feet of the shore, where guide piles would be located. The dock would be hinged at the shore end and buoyantly supported at the seaward end by a 60- by 20-foot float maintained in a position by guide piles. As a result of the buoyant support, the transfer span would always be in a position to load or unload a ferry without other mechanical adjusting mechanisms.

Estimates of total footprint and quantities for cut and fill are outlined in Table 2.4-5. Total fill estimated for the terminal would be 3,150 cubic yards for construction of the ramp; excavation for dock construction is estimated at 5,000 cubic yards. Plan and profile views of the proposed facilities are included in the 2003 EIS (Section 2.4.2). The facility is estimated to have a total footprint of 0.5 acres, located on previously disturbed sites. The material site and the waste material disposal site would be located on King Cove Corporation lands, as identified in the 2003 EIS. A construction barge landing site would likely be required in Lenard Harbor, adjacent to the ferry terminal site, which would be located on King Cove Corporation uplands and State of Alaska tidelands, as identified in the 2003 EIS.

The 2003 EIS identified that the site could be subject to ground failure in the event of an earthquake. Geotechnical evaluation of the site has not been conducted.

Cold Bay Dock Modifications. Modifications to the Cold Bay dock would be as described and depicted in the 2003 EIS; all elements of this portion of the alternative would be required. The dock expansion would allow passengers and freight to be loaded and unloaded near water level. The 2003 EIS (Section 2.4.2) describes the Cold Bay dock expansion to include:

...wave protection, a floating ramp hinged to the existing dock level, vehicle turning area, a small vessel float, and a walkway for walk-on passengers. It would accommodate a vessel with bow- or stern-loading at the level of the cargo hold. In addition to a turning area for larger trucks, the modification would include a 10-foot wide addition for passenger travel away from the area used by vehicles.

No fill or dredging would be required for dock modifications, as piles would be driven by a pile driver mounted on the dock or a barge. This portion of the project would have a 0.6 acre total footprint.

Ferry Acquisition. A 100- to 150-foot displacement monohull, open deck ferry with ice-breaking capabilities would be purchased during the construction window for the project. The length of the ferry described in the 2003 EIS was estimated to be between 100 feet and 150 feet; the EIS used “the larger design to assure that the impact analysis is conservative.” It was assumed a smaller ferry would not change the design of the facilities associated with this alternative, but could change the operating costs.

The ferry would accommodate up to 150 passengers, up to 19 passenger vehicles, and 2 large trucks. This element of the alternative is the same as described and depicted in the 2003 EIS (Section 2.4.6).

Operations and Maintenance

The ferry would provide year round service between Lenard Harbor and the Cold Bay dock, with the trip originating in Lenard Harbor. The ferry would be available for emergency medical evacuations 24 hours per day, 7 days per week.

The operations and maintenance estimates for this alternative considered in this EIS are incorporated from the 2003 EIS (Section 2.4.8). The access road would be maintained for daily use, including signage, regular grading, and snow removal. Road grading would require an ongoing need for gravel for road maintenance over the life of the project. The 2003 EIS did not indicate a probable entity to implement this alternative.

The ferry terminal and dock would be operated and maintained to accommodate passengers and freight, including facility maintenance and snow removal. As envisioned in the 2003 EIS, bulk fuel storage would not be included with this alternative. Fuel would be stored in a small aboveground fuel tank, with fuel delivery via truck.

The ferry maintenance schedule proposed is drawn from the 2003 EIS (Section 2.4.8). The ferry would be removed from service for an average of 7 days every 2 years to comply with Coast Guard dry dock inspections.

Cost

The 2003 EIS estimated the total construction and acquisition costs to range from \$17.8 to \$19.2 million; modification of the Cold Bay dock was estimated at \$6.6 million and acquisition of a ferry was estimated at \$3 to \$5 million. The balance of the costs was estimated for access road construction, easement acquisition, material sources, and construction of the Lenard Harbor terminal. Annual operating costs were estimated to range from \$660,000 to \$1.2 million.

Based on updated estimates, the total cost estimate for project construction and acquisition is \$27.1 million; modification of the Cold Bay dock was estimated at \$12.5 million, acquisition of a ferry was estimated at \$9 million, and the Lenard Harbor facility was estimated at \$5.6 million. The access road has already been completed and so construction costs of the access road were not considered part of this alternative. Costs would also be incurred for material sources. The estimated annual operation and maintenance cost for this alternative is \$2.6 million per year, including approximately \$460,000 in annual maintenance cost for both docks and for 5.6 miles of road between the King Cove Airport and both ferry terminals. Operating expenses were assumed to be the same as Alternative 4, based on ferry service 6 days per week. The 35-year life cycle cost for the ferry alternative was estimated at \$71.7 million.

2.4.6 Lands Involved in Proposed Action and Alternatives

The parcels involved in the proposed land exchange under Alternatives 2 and 3 and other lands potentially affected by these alternatives are listed in Table 2.4-6. Alternatives 1, 4 and 5 would not include a land exchange. Alternatives 2 and 3 would encumber other federal and private parcels in addition to the exchange lands: an alternate land selection within Alaska Peninsula National Wildlife Refuge, a private parcel in the vicinity of Blinn Lake (Alternative 3 only), and an administrative boundary adjustment between Izembek and Alaska Peninsula National Wildlife Refuges. In addition, upon completion of the land exchange proposed under Alternatives 2 or 3, Izembek State Game Refuge would also include state lands and water in the vicinity of Kinzarof Lagoon, in accord with the *Izembek State Game Refuge Land Exchange Bill*.

Lands potentially affected by the proposed project under Alternatives 1, 4, or 5 are summarized in Table 2.4-7. Alternatives 1, 4, or 5 would potentially affect federal, state, and private parcels. The lands selected by King Cove Corporation within Izembek Wilderness could eventually be conveyed to the corporation if Alternative 1, 4, or 5 were implemented.

Descriptions of the exchange parcels are included in Appendix B. Further description of lands is included in Section 3.3.1 and in Chapter 4.

2.5 Selection of the Preferred Alternative

The Council on Environmental Quality has defined the “agency’s preferred alternative” as the alternative “which the agency believes will fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors” (CEQ 1981). The Council on Environmental Quality *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (2005) require the identification of the preferred alternative in the Draft EIS if the agency has made such a determination; the Final EIS must identify the agency’s preferred alternative (40 CFR 1502.14(e)).

2.6 Environmentally Preferable Alternative

The Council on Environmental Quality regulations (CEQ 2005) require the identification of alternatives that are considered environmentally preferable to be made in the Record of Decision after public review and comment on the Final EIS (40 CFR 1505.2(b)). The Council on Environmental Quality defines the environmentally preferable alternative as the alternative(s) that will promote the national environmental policy as expressed in NEPA Section 101.

Table 2.4-6 Land Exchange Parcels and Lands Potentially Affected under Alternatives 2 and 3

Parcel	Current Surface Owner	Current Subsurface Owner	Estimated Area (Acres)	Current Management Regime
Road Corridor	Federal –Service and Federal Aviation Administration	Federal	201± Alt 2 227± Alt 3	Wilderness and National Wildlife Refuge; Withdrawal for Federal Aviation Administration
Sitkinak Island	Federal – Coast Guard and Service	Federal	1,619±	Airstrip, Coast Guard Base
State Lands	State – Department of Natural Resources	State	41,887±	General Use
Mortensens Lagoon	Native Corporation – King Cove Corporation	Native Corporation – The Aleut Corporation	8,092±	Private
Kinzarof Lagoon	Native Corporation – King Cove Corporation	Federal	2,604±	Private
King Cove Corporation Selected Lands	Federal – King Cove Corporation Selection	Federal	5,430±	Wilderness
Alternate Land Selection in Alaska Peninsula National Wildlife Refuge	Federal	Federal	5,430±	National Wildlife Refuge
National Wildlife Refuge Boundary Adjustment near Blinn Lake	Federal –Federal Aviation Administration and Service	Federal	2,514±	Federal Aviation Administration and National Wildlife Refuge
RCA Parcel	Private (Alternative 3 only)	Private	23±	Private
Kinzarof Lagoon added to Izembek State Game Refuge	State	State	4,320±	General Use

Table 2.4-7 Lands Potentially Affected under Alternatives 1, 4 or 5

Parcel	Current Surface Owner	Current Subsurface Owner	Area (Acres)	Current Management Regime
Northeast Terminal Site	King Cove Corporation, State	State	No new footprint	Private; construction site
Lenard Harbor Ferry Terminal Site	King Cove Corporation, State	The Aleut Corporation, State	0.5	Private
Cold Bay Dock Site	State	State	Less than 0.1 acre	Public Dock (owned by Aleutians East Borough)
King Cove Corporation Selected Lands	Federal – King Cove Corporation Selection	Federal	5,430±	Wilderness

The Council on Environmental Quality encourages agencies to make recommendations regarding the environmentally preferable alternative(s) in the Draft EIS. The identification of the environmentally preferable alternative may involve difficult judgments, particularly when one environmental value must be balanced against another. The public and other agencies reviewing a Draft EIS can assist in the development and determination of the environmentally preferable alternative(s) by providing their views in comments on the Draft EIS.

2.7 Mitigation and Monitoring

NEPA was enacted to promote efforts that will prevent or eliminate damage to the human environment. Many federal agencies and applicants include mitigation measures as integral components of a project's design. Agencies may also commit to:

- Avoiding an impact by not taking a certain action or parts of an action;
- Minimizing an impact by limiting the degree or magnitude of an action and its implementation;
- Rectifying an impact by repairing, rehabilitating, or restoring the affected environment;
- Reducing or eliminating an impact over time, through preservation and maintenance operations during the life of the action; and
- Compensating for an impact by replacing or providing substitute resources or environments.

Agencies may also commit to mitigation measures as parts of alternatives in an EIS so as to achieve an environmentally preferable outcome. The Council on Environmental Quality recently provided additional guidance on appropriate use of mitigation and monitoring, with specific emphasis on ensuring that mitigation commitments are implemented, monitored for effectiveness, failed mitigation measures are remedied, and the public is involved in mitigation planning.

The guidelines for development of mitigation measures include the following steps:

- Identify mitigation measures that would eliminate or lessen adverse environmental effects (physical, biological, and social) by alternative if appropriate;

- Describe best management practices that would avoid, minimize or mitigate short-term (construction) and/or long-term impacts (operational); and
- Discuss monitoring that could be implemented to ensure that the mitigation/best management practices were being met and provide adaptive management scenarios if necessary.

Mitigation measures for this EIS are identified in the Appendix F. Sources for mitigation measures were: the Act, the 2003 EIS, and additional recommended mitigation measures identified by the resource analysts.

The Act identifies that a cable barrier or alternate barrier is required to be constructed on each side of the road and an enforceable mitigation plan shall be developed based on the evaluation of impacts identified in the EIS. The Act also requires that the proposed project avoid impacts to wildlife and provide for mitigation of wetland loss. Refer to Appendix A for a complete narrative of mitigation requirements in the Act.

The 2003 EIS identified 12 mitigation measures. Several of these mitigation measures have been adopted, where appropriate. Minor modifications have been made to the mitigation measures, as it is acknowledged that several changes in authority or responsibility have occurred since the 2003 EIS was developed. For example, the 2003 EIS assumed the project applicant was the Aleutians East Borough. This analysis does not assume the project applicant is the Aleutians East Borough, but that the project applicant would be responsible for the specified action.

Additional recommended mitigation measures were also identified by resource analysts. The additional recommended mitigation measures would further reduce impacts, as described in Chapter 4.

The enforceable mitigation plan, identified in the Act, would be developed if the Secretary of the Interior determines a land exchange is in the public interest. Detailed descriptions of the mitigation measures and responsibilities for enforcement would be provided in that plan.

2.8 Comparison of Alternatives

This section provides a summary comparison of major features of the 5 alternatives considered in this EIS. The topics reviewed include the indicators from the discipline-specific analyses found in Chapter 4. The summary effects range from negligible to major. No effect is also possible.

- No effect: The alternative would not affect the resource.
- Negligible: Impacts are generally extremely low in intensity (often they cannot be measured or observed), are temporary, localized, and do not affect unique resources.
- Minor: Impacts tend to be low intensity, of temporary duration, and local extent, although common resources may experience more intense, longer-term impacts.
- Moderate: Impacts can be of any intensity or duration, although common and important resources may be affected by higher intensity, longer term, or broader extent impacts. Unique resources may be affected by medium or low intensity impacts, shorter duration or intermittent episodes of impact over a long period, at a local or regional scale.
- Major: Impacts are generally medium or high intensity, long-term or permanent in duration, of regional or extended scope, and affect important or unique resources.

Impacts may be beneficial or adverse. Impacts are generally assumed to be adverse, unless specifically noted. While some impacts are readily evaluated as beneficial or adverse, others may consist of complex trade-offs, including both beneficial and adverse elements. These are characterized as indeterminate. For example, the effects to wilderness under the road alternatives include both removing land from wilderness to construct the proposed road and adding large tracts of land to wilderness. This is a complex trade-off; acres added or removed from wilderness are not the single factor that characterizes the action as either beneficial or adverse. The public comments on the Draft EIS clearly indicated a difference in values regarding some of the potential impacts of the alternatives. Impacts to public health and safety, wildlife, wetlands, wilderness, and subsistence are among the key elements of the decision to be made in this EIS. Where there are notable trade-offs, the effects are disclosed, but the deciding officer will make the evaluation of the character of the impact.

Table 2.8-1 displays a summary of the impacts by resource area. Several resources analyzed in detail in Chapter 4 do not appear in Table 2.8-1 because the effects were minor or less for all alternatives. The effects for air quality, climate, hazardous materials, noise, marine mammals, socioeconomics, environmental justice, subsistence, and cultural resources are all at a minor level or less across all alternatives. (The analysis for noise does acknowledge temporary moderate impacts during the construction stage, but the overall effect for noise was considered minor.)

Table 2.8-1 Impact Summary by Alternative

	Alternative 1: No Action	Alternative 2: Land Exchange and Southern Road Alignment	Alternative 3: Land Exchange and Central Road Alignment	Alternative 4: Hovercraft Operations from the Northeast Terminal to Cross Wind Cove 6 days per Week	Alternative 5: Lenard Harbor Ferry with Cold Bay Dock Improvement
Geology and Soils					
Overall Effects	Alternative 1 would result in <i>no effects</i> on geology and soils in the project area. The potential effects from future landing craft operations cannot be quantified.	Though impacts from Alternative 2 would be reduced in the period following the project completion, construction would disturb a total of 107 acres of surface and shallow subsurface soil along the road corridor and less than 1 acre at a construction staging area near the Northeast Terminal and 6 acres at a material site on King Cove Corporation lands. Approximately 111,000 cubic yards of material would be excavated during cut and fill activities. The effect would be <i>moderate</i> .	Effects of Alternative 3 would be similar to those in Alternative 2, disturbing a total of 100 acres of surface and shallow subsurface soil along the road corridor and less than 1 acre at a construction staging area near the Northeast Terminal and 7 acres at a material site on King Cove Corporation lands. Approximately 99,000 cubic yards of material would be excavated during cut and fill activities. The effect would be <i>moderate</i> .	Effects may include shoreline erosion from wave action generated by the hovercraft during departures and arrivals. Because of the frequency of the hovercraft operation, the effect would be <i>negligible to minor</i> .	There would be <i>no effects</i> on geology and soils from operation and maintenance of a ferry. <i>Minor</i> effects would occur due to dock construction activities, because of the disturbance to submerged sediments as a result of dredging and pile driving. Less than 1 acre of land would be disturbed.
Cumulative Effects	With no direct or indirect effects to geology and soils expected under Alternative 1, there would be <i>no</i> contribution to cumulative effects on these resources. Landing craft effects cannot be quantified at this time.	The resulting erosion of soil in areas disturbed by construction or staging could lead to water channelization of runoff, and would add to existing effects on geology and soil resources. The cumulative effect would be <i>moderate</i> .	Cumulative effects would be similar to those discussed under Alternative 2, <i>moderate</i> .	The incremental addition to cumulative effects would be <i>negligible</i> .	There would be <i>negligible</i> incremental additions to cumulative effects as a result of construction activities on less than 1 acre at the Lenard Harbor site.

	Alternative 1: No Action	Alternative 2: Land Exchange and Southern Road Alignment	Alternative 3: Land Exchange and Central Road Alignment	Alternative 4: Hovercraft Operations from the Northeast Terminal to Cross Wind Cove 6 days per Week	Alternative 5: Lenard Harbor Ferry with Cold Bay Dock Improvement
Hydrology/Hydrologic Processes					
Overall Effects	Alternative 1 would have <i>no</i> direct or indirect effect on hydrologic resources. If landing craft service is implemented at some date in the future, this could result in <i>negligible</i> effects.	Effects to hydrologic resources would occur as a result of fill placement in approximately 3.8 acres of wetland, and the installation of an estimated 162 drainage structures along the road. The uncontained release of hazardous materials and from stream turbidity generated by streambank construction activities could also occur. The increase in sediment load from road runoff would impact the quality of water bodies which are considered Essential Fish Habitat. The effect would be <i>moderate</i> .	Effects to hydrologic resources would occur as a result of fill placement in approximately 2.4 acres of wetland, and the installation of an estimated 173 drainage structures along the road. The uncontained release of hazardous materials and from stream turbidity generated by streambank construction activities could also occur. The increase in sediment load from road runoff would impact the quality of water bodies which are considered Essential Fish Habitat. The effect would be <i>moderate</i> .	Impacts to hydrologic resources related to the implementation of Alternative 4 would result in <i>negligible</i> effects. These effects may include fuel and sewage releases at the docking locations and along the preferred routes.	The greatest impacts to water quality include increase in turbidity due to dredging and pile driving activities at the Lenard Harbor ferry terminal and modifications at the Cold Bay Dock and refueling of the ferry in open water. As construction would be limited to less than 1 acre, activities would have <i>negligible</i> effects on hydrologic resources within the project area. Effects from operation and maintenance of a ferry could include effects from the release of hazardous materials would also be <i>negligible</i> .
Cumulative Effects	Alternative 1 would have <i>no</i> contribution to cumulative effects on these resources. If landing craft service is implemented at some date in the future, this could result in <i>negligible</i> effects.	Long-term maintenance of stream crossings would be additive to those impacts derived during construction activities. Effects could include potential non-point source pollution and unlawful stream crossings along the margins of the road corridor by the general public. Effects would be <i>moderate</i> .	The contribution to cumulative effects would be similar to those described under Alternative 2, <i>moderate</i> .	The incremental addition to cumulative effects on hydrologic resources would be <i>negligible</i> due to potential fuel and sewage releases at the docking locations and along the preferred routes.	There would be <i>negligible</i> incremental additions to cumulative effects on water resources and water quality within Cold Bay. The impacts from ferry vessels may include fuel and sewage releases at the docking locations and along the preferred routes of the ferry vessels.

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Terrestrial and Aquatic Plant Communities					
Overall Effects	There would be <i>minor</i> (indirect) effects on vegetation from conveyance of the King Cove Corporation selected lands.	Construction would cause the loss of approximately 107 acres of native plant communities along the proposed road corridor and the loss of approximately 1 acre of native vegetation at 2 temporary barge landing sites. The overall effect would be <i>moderate</i> .	Construction would cause the loss of approximately 100 acres of native plant communities along the proposed road corridor and the loss of approximately 1 acre of native vegetation at 2 temporary barge landing sites. The overall effect would be <i>moderate</i> .	Operation of the hovercraft from the Northeast Terminal may create more opportunity for the spread of invasive species in the Izembek National Wildlife Refuge vicinity. Potential development associated with the conveyance of King Cove Corporation selected land could alter vegetation in the local area. The effect would be <i>minor</i> .	Invasive species are located in Cold Bay and are also likely present in the King Cove vicinity. These species may be transported to new locations by operation of the ferry. Potential development associated with the conveyance of King Cove Corporation selected land could alter vegetation in the local area. The effect would be <i>minor</i> .
Cumulative Effects	Alternative 1 would make a <i>minor</i> contribution to cumulative effects to vegetation from the conveyance of the King Cove Corporation selected lands.	The completion of the road to the Northeast Terminal would contribute to effects on vegetation. The opportunity for invasive species to spread within the Izembek National Wildlife Refuge vicinity would increase. Cumulative effects would be <i>moderate</i> .	Cumulative effects would be similar to those discussed under Alternative 2, <i>moderate</i> .	Alternative 4 would make a <i>minor</i> contribution to cumulative effects to vegetation from the conveyance of the King Cove Corporation selected lands.	Less than 1 acre of native shoreline plant communities would be affected during construction. Indirect effects could include the transportation of invasive species to new locations by operation of the ferry. The selected parcel could be conveyed to King Cove Corporation. Alternative 1 would make a <i>minor</i> contribution to cumulative effects to vegetation.

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Wetlands					
Overall Effects	Alternative 1 would result in <i>minor</i> (indirect) effects on wetlands from conveyance of the King Cove Corporation selected lands.	An estimated total of 3.8 acres of wetland would be filled and 162 drainage structures would be constructed. The effect of modifications to wetland hydrology and vegetation would be <i>moderate</i> .	An estimated total of 2.4 acres of wetland would be filled and 173 drainage structures would be constructed. The effect of modifications to wetland hydrology and vegetation would be <i>moderate</i> .	Effects would be similar to Alternative 1, with <i>minor</i> effects from the conveyance of the King Cove Corporation selected lands.	The result of construction of Alternative 5 would include the loss of wetland or wetland functions on less than 1 acre of beach system wetlands. Minor indirect effects to wetlands could result from conveyance of the King Cove Corporation selected lands similar to Alternative 1. The operation of a ferry would not have any effect on wetlands. The overall impact would be <i>minor</i> .
Cumulative Effects	Alternative 1 would make a <i>minor</i> contribution to cumulative effects to wetlands from the conveyance of the King Cove Corporation selected lands.	The completion of the road to the Northeast Terminal would contribute to effects on wetlands. Cumulative effects would be <i>moderate</i> .	Effects would be similar to Alternative 2, <i>moderate</i> .	Effects would be similar to Alternative 1, with a <i>minor</i> contribution to cumulative effects to wetlands from the conveyance of the King Cove Corporation selected lands.	Less than 1 acre of wetlands would be affected during construction. Other contributions to cumulative effects would be similar to Alternative 1, due to the conveyance of the King Cove Corporation selected lands. Cumulative effects would be <i>minor</i> .

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Fish and Essential Fish Habitat					
Overall Effects	There would be <i>no</i> new effects on fish and essential fish habitat. If landing craft service is implemented at some date in the future, this would result in <i>negligible</i> effects.	Alternative 2 involves 8 crossings of anadromous or fish-bearing streams, but construction effects to anadromous species habitat are not anticipated to be measurable. Unavoidable indirect effects such as erosion from record storm events and pollution from anthropogenic causes could occur. The effect could be <i>moderate</i> .	Alternative 3 involves 2 crossings of anadromous or fish-bearing streams, but effects to anadromous species habitat are not anticipated to be measurable. Unavoidable indirect effects such as erosion from record storm events and pollution from anthropogenic causes could occur. The effect could be <i>moderate</i> .	The combined effects on fish and fish habitat under Alternative 4 would primarily result from hovercraft noise. Effects would be considered <i>negligible</i> .	It is unlikely that Essential Fish Habitat would be affected by dock construction or ferry operation. The effect would be <i>negligible</i> .
Cumulative Effects	Effects from a possible landing craft operation at some future date would be primarily associated with vessel noise, which would be a <i>negligible</i> contribution to cumulative effects on fish and Essential Fish Habitat under Alternative 1.	Cumulative effects would include unavoidable indirect effects such as reduction in water quality through erosion, sedimentation, and pollution from vehicles and other anthropogenic sources. The cumulative effect would be <i>moderate</i> .	Cumulative effects would be similar to those discussed under Alternative 2, <i>moderate</i> .	Effects would be similar to Alternative 1, <i>negligible</i> .	Effects would be similar to Alternative 1, and considered <i>negligible</i> .

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Birds					
Overall Effects	Alternative 1 would result in <i>minor</i> (indirect) effects on birds from conveyance of the King Cove Corporation selected lands. If landing craft service is implemented at some date in the future, this would result in an additional <i>negligible</i> increment of effects to birds. The overall effect would be <i>minor</i> .	Alternative 2 would have a <i>major</i> effect on Tundra Swans, Brant, and Emperor Geese. Effects to other breeding birds would be <i>minor</i> in the project area <i>moderate to major</i> near the road. Effects on other migrating/wintering birds would be <i>moderate</i> , and <i>negligible</i> effects on seabirds.	Alternative 3 would have a <i>major</i> effect on Tundra Swans, Brant, and Emperor Geese, <i>moderate</i> effects on other breeding birds and other migrating/wintering birds, and <i>negligible</i> effects on seabirds.	Alternative 4 could affect short-term behavior for seabirds and waterfowl. The overall effect would be <i>minor</i> .	Alternative 5 could affect short-term behavior for seabirds and waterfowl. Oil or other contaminant leaks are possible. Because the ferry would operate once a day, and the risk of spills is small, the overall effect would be <i>minor</i> .
Cumulative Effects	Alternative 1 would make a <i>minor</i> contribution to cumulative effects to birds from the conveyance of the King Cove Corporation selected lands.	Alternative 2 would increase human access, hunting pressure, and disturbance for birds, causing displacement from feeding or nesting areas. Alternative 2 would contribute a <i>major to moderate</i> contribution to cumulative effects on Tundra Swans, Brant, Emperor Geese, and other migrating/wintering birds, a <i>moderate</i> effect on most other breeding birds, and <i>negligible</i> effect on seabird species.	Cumulative effects would be similar to those discussed under Alternative 2, a <i>major to moderate</i> contribution to cumulative effects on Tundra Swans, Brant, Emperor Geese, and other migrating/wintering birds, a <i>moderate</i> effect on most breeding birds, and <i>negligible</i> effect on seabird species.	Alternative 4 would make a <i>minor</i> contribution to cumulative effects to birds from the conveyance of the King Cove Corporation selected lands	Less than 1 acre would be affected during construction. Other contributions to cumulative effects would be similar to Alternative 1, due to the conveyance of the King Cove Corporation selected lands. The contribution of Alternative 5 to cumulative effects on birds is considered <i>minor</i> .

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Land Mammals					
Overall Effects	Alternative 1 would result in <i>minor</i> (indirect) effects on land mammals from conveyance of the King Cove Corporation selected lands. There would be <i>no</i> direct effects on land mammals from construction or operation and maintenance. If landing craft service is implemented at some date in the future, this would result in <i>negligible</i> effects. The overall effect to land mammals would be <i>minor</i> .	Behavior changes, increased human access, and collisions with vehicles could occur with the Alternative 2 road. Effects to brown bears are considered <i>major</i> . The effects to caribou would be <i>moderate</i> , but the effects could be major if caribou migration is interrupted. However, the likelihood of that outcome is judged to be low. The overall effect would be <i>minor</i> for small mammals and furbearers and <i>moderate</i> for other large mammals.	The effects of Alternative 3 are similar to that of Alternative 2. The road's central route could increase potential effects to migrating caribou, and essentially bisects large mammal habitat between Izembek and Kinzarof lagoons. Effects to brown bears are considered <i>major</i> . The effects to caribou would be <i>moderate</i> , but the effects could be major if caribou migration is interrupted. However, the likelihood of that outcome is judged to be low. The overall effect would be <i>minor</i> for small mammals and furbearers and <i>moderate</i> for large mammals.	The noise and sight of the hovercraft as it begins operations at the Northeast Terminal and lands at Cross Wind Cove may startle land mammals, causing them to alter their behavior briefly. Because the frequency of disturbance is low, the summary impact would be <i>minor</i> .	Although the noise and sight of construction and the operation of the ferry may temporarily startle land mammals, it would be a predictable disturbance occurring in a limited area. Human activities at the Lenard Harbor Ferry Terminal and Cold Bay Dock would likely have a <i>negligible</i> effect on land mammals, but the effects on caribou from construction of the terminal could be <i>minor</i> .
Cumulative Effects	The conveyance of the King Cove Corporation selected lands would result in <i>minor</i> indirect effects. The overall contribution of Alternative 1 to cumulative effects is considered <i>minor</i> .	Alternative 2 would increase human access, hunting pressure, and disturbance for land mammals, causing displacement from caribou migration patterns or bear feeding areas. The contribution to cumulative effects would be <i>moderate</i> for large mammals and <i>minor</i> for small mammals and furbearers.	Cumulative effects associated with Alternative 3 would be similar to those associated with Alternative 2. Although potential direct and indirect impacts to caribou could be greater under Alternative 3 because of more proximity to migration patterns, the contribution to cumulative impacts would remain <i>moderate</i> for large mammals and <i>minor</i> for small mammals and furbearers.	Human activities would cause increased disturbance to land mammals in the vicinity of the hovercraft terminal areas. The conveyance of the King Cove Corporation selected lands would result in <i>minor</i> indirect effects. Alternative 4 would result in a <i>minor</i> contribution to cumulative effects on land mammals.	Less than 1 acre would be affected during construction. Other contributions to cumulative effects would be similar to Alternative 1, due to the conveyance of the King Cove Corporation selected lands. The contribution of Alternative 5 to cumulative effects on land mammals is considered <i>negligible</i> .

	Alternative 1: No Action	Alternative 2: Land Exchange and Southern Road Alignment	Alternative 3: Land Exchange and Central Road Alignment	Alternative 4: Hovercraft Operations from the Northeast Terminal to Cross Wind Cove 6 days per Week	Alternative 5: Lenard Harbor Ferry with Cold Bay Dock Improvement
Threatened and Endangered Species					
Overall Effects	With no new activities from operation and maintenance of transportation methods, beyond those already existing, Alternative 1 would have <i>no</i> direct or indirect effects on threatened and endangered species from operation and maintenance. Effects from a future landing craft/passenger ferry service cannot be determined at this time.	Construction and operation of the southern road corridor could disturb Steller's Eiders and Yellow-billed Loons from the fall through spring. Eiders are particularly vulnerable to disturbance during pre-migration staging in the spring and the fall molt in the fall. Kittlitz's Murrelets could be disturbed during the breeding season but the disturbance would be limited to occasional flyovers as they are not expected to nest near the road corridor. Construction and operation could elicit disturbance responses from sea otters using northern Kinzarof Lagoon during the summer months. There would be <i>no effect</i> to sea lions, as they do not normally occur in the project area. The overall effect to other threatened and endangered species would be <i>minor</i> , except for Steller's Eiders, which would experience <i>moderate</i> effects.	The central road alignment could lead to an increase in waterfowl hunting pressure in Izembek Lagoon due to improved access for foot and all-terrain vehicle travel. Izembek Lagoon is an important molting area for thousands of Steller's Eiders in the fall, coinciding with the timing of waterfowl hunting for Brant and other species. The direct and indirect impacts from construction are considered to be <i>negligible to minor</i> . Direct and indirect effects from operation and maintenance are considered <i>moderate</i> for Steller's Eiders and <i>minor</i> for Yellow-billed Loon, and <i>negligible to minor</i> for Kittlitz's Murrelet. Similar to Alternative 2, the effects on sea otters would be <i>minor</i> , with <i>no effects</i> to Steller sea lions.	Given the mitigating restrictions under which the hovercraft would operate, particularly the exclusion zone in northern Cold Bay, disturbance effects on Steller's Eiders, Yellow-billed Loons, Kittlitz's Murrelets, northern sea otters, and Steller sea lions from the operation and maintenance of the hovercraft as proposed under Alternative 4 would be <i>negligible to minor</i> .	Noise generated from construction activities, including pile-driving, associated with modifications to the existing Cold Bay dock may disturb Steller's Eiders, Yellow-billed Loons, or Kittlitz's Murrelets. However, these species are not present for most of the summer construction season and/or do not frequent the dock area, which would minimize impacts. Construction would have <i>negligible</i> effects to northern sea otters and Steller sea lions. Operations would elicit noise similar to fishing vessels already operating in the area, and the ferry would be slow-moving enough that wildlife could avert collisions. Effects to threatened and endangered species would be <i>negligible to minor</i> .
Cumulative Effects	Alternative 1 would result in <i>no</i> contribution to cumulative effects on these resources. The effects from a possible landing craft operation at some future date cannot be determined.	The contribution to cumulative effects of this alternative would be <i>moderate</i> for Steller's Eider, and <i>negligible to minor</i> for Yellow-billed Loon, Kittlitz's Murrelet, and northern sea otters, and <i>no</i> contribution to cumulative effects for Steller sea lions.	The contribution to cumulative effects of this alternative would be <i>moderate</i> for Steller's Eider, <i>negligible to minor</i> for Yellow-billed Loon, Kittlitz's Murrelet, and northern sea otters, and <i>no</i> contribution to cumulative effects for Steller sea lions.	The contribution to cumulative effects of this alternative would be <i>negligible to minor</i> for Steller's Eider due to the speed and noise of hovercraft operations. Effects would be <i>negligible</i> for northern sea otters, and Steller sea lions.	The contribution to cumulative effects of this alternative would be <i>negligible</i> for Steller's Eider, northern sea otters, and Steller sea lions.

	Alternative 1: No Action	Alternative 2: Land Exchange and Southern Road Alignment	Alternative 3: Land Exchange and Central Road Alignment	Alternative 4: Hovercraft Operations from the Northeast Terminal to Cross Wind Cove 6 days per Week	Alternative 5: Lenard Harbor Ferry with Cold Bay Dock Improvement
Land Ownership and Management					
Overall Effects	Under Alternative 1, a road connecting the communities of King Cove and Cold Bay would not be built and no land exchange would occur. Current land use would remain unchanged, and management plans would remain in effect. As an indirect effect, King Cove Corporation selected lands would be conveyed, affecting 5,430 acres currently managed as part of the Izembek Wilderness. The overall impact of Alternative 1 on land ownership, use, and management would be <i>minor (indeterminate)</i> and would not diminish the Service's ability to achieve refuge purposes.	The magnitude of impact would be high for the Service, with a low impact on ownership but a high impact on management. For the State, the impacts would be medium, with low impacts on land ownership, but a high change in management responsibilities for the new road corridor. For the King Cove Corporation, the impact would be high in magnitude, due to a larger change in land ownership, and a low change in management. The summary impact of Alternative 2 on land use and management would be considered <i>major (indeterminate)</i> and would diminish the Service's ability to achieve refuge purposes.	The direct and indirect effects on land ownership, use, and management would be very similar to Alternative 2. An additional 26 acres of refuge lands would be required for exchange to accommodate this alignment. The summary impact of Alternative 3 on land use and management would be considered <i>major (indeterminate)</i> and would diminish the Service's ability to achieve refuge purposes.	The effects of Alternative 4, with respect to land ownership, management, and use are identical to those of Alternative 1. The overall impact would be <i>minor (indeterminate)</i> and would not diminish the Service's ability to achieve refuge purposes.	The effects of Alternative 5, with respect to land ownership, management, and use are identical to those of Alternative 1 and 4. The overall impact would be <i>minor (indeterminate)</i> and would not diminish the Service's ability to achieve refuge purposes.

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Cumulative Effects	Relevant past actions include the entitlement and selection of King Cove Corporation land under ANCSA, and the enactment of ANILCA which redesignated the Izembek National Wildlife Refuge and created the Izembek Wilderness. The incremental contribution of Alternative 1 to cumulative effects on land ownership, use, and management would be <i>minor (indeterminate)</i> .	Relevant past actions include the entitlement and selection of King Cove Corporation land under ANCSA, and the enactment of ANILCA that redesignated the Izembek National Wildlife Refuge and designated Izembek Wilderness. The incremental contribution to cumulative effects would be <i>major (indeterminate)</i> for land ownership. Potential increases in unauthorized all-terrain vehicle use would have a <i>major (adverse)</i> contribution to cumulative effects on land management.	Cumulative effects for Alternative 3 would be nearly identical to Alternative 2, differing only in the location and amount of federal acreage exchanged for the road corridor. The incremental contribution of Alternative 3 to cumulative effects to land ownership would be <i>major (indeterminate)</i> and to land management would be <i>major (adverse)</i> .	The contribution to cumulative effects for Alternative 4 is the same as Alternative 1 for land ownership, use, and management. The cumulative effect would be <i>minor (indeterminate)</i> .	The contribution to cumulative effects for Alternative 5 is the same as for Alternatives 1 and 4 for land ownership, use, and management. The cumulative effect would be <i>minor (indeterminate)</i> .

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Transportation					
Overall Effects	Alternative 1 introduces <i>no</i> new effects to transportation availability or existing transportation systems.	A road would add <i>moderate</i> impacts to existing transportation facilities over 2 years during the construction phase. Alternative 2 would result in distinctive changes in consumer transportation options, patterns, and costs. The road would provide a new, year round transportation link between the communities of King Cove and Cold Bay. The summary impact on transportation would be <i>major (beneficial)</i> .	The summary effect of Alternative 3 is similar to that of Alternative 2, <i>moderate</i> during the construction phase and overall <i>major (beneficial)</i> impact to transportation.	The hovercraft would operate 6 days per week, year round, to provide an additional transportation link for the region, which would benefit approximately 1,600 projected passengers per year. The former 70 percent reliability level may reduce the opportunity for emergency charters. The summary impact on existing transportation systems, with an increased number of weekly operations, would be <i>moderate (indeterminate)</i> .	A ferry would provide another form of transportation, besides air, between the cities of King Cove and Cold Bay, benefitting about 1,600 passengers a year. The ferry would operate 6 days per week, with an estimated 95 percent reliability. The summary impact for Alternative 5 on transportation is considered to be <i>moderate (indeterminate)</i> .
Cumulative Effects	Alternative 1 would <i>not contribute</i> to cumulative effects on transportation. The possible effects of a landing craft, if implemented at some date in the future, cannot be determined without information on the frequency of service and other operating factors.	The presence of a road could lead to more surface vehicles and increase traffic in both cities over the long term. Additional traffic could instigate further road improvements and new construction within the communities of King Cove and Cold Bay. The contribution of Alternative 2 to cumulative effects on transportation would be <i>major (beneficial)</i> .	The summary cumulative effect of Alternative 3 is similar to that of Alternative 2, <i>major (beneficial)</i> .	Cumulative effects would include an annual \$2.2 million subsidy for operations. Alternative 4 would have a <i>moderate (indeterminate)</i> cumulative effect to transportation due to fiscal impacts and the addition of a regional transportation link.	Cumulative effects would include an annual \$2.5 million subsidy for operations. Alternative 5 would have a <i>moderate (indeterminate)</i> cumulative effect to transportation due to fiscal impacts and the addition of a regional transportation link.

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Public Health and Safety					
Overall Effects	Alternative 1 introduces <i>no</i> new direct or indirect effects on public health and safety and continues the status quo of transportation options and access to health services.	Under Alternative 2, there would be increased opportunity for people in the City of King Cove to travel to the Cold Bay Airport for access to advanced medical services. Road transportation, while too slow for some emergencies, would be available most days. The road would introduce new law enforcement responsibilities. While no new personnel are anticipated to be hired to monitor impacts or provide law enforcement, additional demands on these resources are anticipated. The summary effect to public health and safety would be <i>major (beneficial)</i> .	The summary effect of Alternative 3 is similar to that of Alternative 2, <i>major (beneficial)</i> .	In Alternative 4, the hovercraft would have regularly scheduled trips for 6 days/week year round and could be available for emergency medical evacuations most times. The historical approximately 70 percent reliability rate may reduce availability for emergencies, but it could also substitute when weather conditions are adverse for air transport. The summary effect to public health and safety would be <i>major (beneficial)</i> .	In Alternative 5, the ferry would have regularly scheduled trips for 6 days/week year round and would be available for emergency medical evacuations most times. Ferry operations typically have a reliability rate of approximately 95 percent. It is somewhat slower than other transport options, so may not be suitable for some emergencies. The summary effect to public health and safety would be <i>major (beneficial)</i> .
Cumulative Effects	Under Alternative 1, limited availability of safe transportation to needed medical services would continue. Alternative 1 would make <i>no</i> contribution to cumulative effects on public health and safety.	Emergency medical transports have historically been primarily conducted by air and hovercraft. The addition of road transportation, while not suitable for all emergencies, would have a <i>major (beneficial)</i> cumulative effect on public health and safety.	The summary cumulative effect of Alternative 3 is similar to that of Alternative 2, <i>major (beneficial)</i> .	Alternative 4 would have a <i>moderate (beneficial)</i> contribution to cumulative effects on public health and safety. This alternative would supplement existing air transport, maximizing opportunity for emergency travel.	Alternative 5 would have a <i>moderate (beneficial)</i> contribution to cumulative effects on public health and safety. This alternative would supplement existing air transport, maximizing opportunity for emergency travel.

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Public Use					
Overall Effects	The conveyance of the King Cove Corporation selected lands would result in <i>minor</i> indirect effects to public use. The parcel would be subject to the requirements of Section 22 (g) of ANCSA. Future public uses of the parcel would be subject to authorization by the private land owner. The overall impact would be <i>minor</i> .	The transfer of state and Native Corporation lands to federal management would restrict activities to those permitted in a wilderness or national wildlife refuge. The transfer of federal lands to the state would shift public use of wilderness lands to transportation corridor uses. The exchange would constitute a noticeable change in land management and types of uses. The effects on public use from the land exchange would be <i>major (indeterminate)</i> .	Alternative 3 would have the same effects as Alternative 2, <i>major (indeterminate)</i> .	The conveyance of the King Cove Corporation selected lands would result in <i>minor</i> indirect effects to public use. The parcel would be subject to the requirements of Section 22 (g) of ANCSA. Future public uses of the parcel would be subject to authorization by the private land owner. The overall impact would be <i>minor</i> .	The conveyance of the King Cove Corporation selected lands would result in <i>minor</i> indirect effects to public use. The parcel would be subject to the requirements of Section 22 (g) of ANCSA. Future public uses of the parcel would be subject to authorization by the private land owner. The overall impact would be <i>minor</i> .
Cumulative Effects	The cumulative impacts of Alternative 1 are considered <i>negligible</i> , due to the low levels of use on the parcel selected by the King Cove Corporation.	This alternative could increase opportunities for prohibited access of motorized vehicles. Increased access to hiking areas could expand areas used for berry-picking, photography, and other public uses. The contribution to cumulative effects would be <i>minor (indeterminate)</i> .	Alternative 3 would have the same contribution to cumulative effects as Alternative 2, <i>minor (indeterminate)</i> .	The cumulative impacts of Alternative 4 are considered <i>negligible</i> , due to the low levels of use on the parcel selected by the King Cove Corporation.	The cumulative impacts of Alternative 5 are considered <i>negligible</i> , due to the low levels of use on the parcel selected by the King Cove Corporation.

	Alternative 1: No Action	Alternative 2: Land Exchange and Southern Road Alignment	Alternative 3: Land Exchange and Central Road Alignment	Alternative 4: Hovercraft Operations from the Northeast Terminal to Cross Wind Cove 6 days per Week	Alternative 5: Lenard Harbor Ferry with Cold Bay Dock Improvement
Visual Resources					
Overall Effects	Alternative 1 introduces <i>no</i> new direct impacts to visual resources, and <i>negligible</i> indirect impacts associated with conveyance of the selected lands. Future use of the King Cove Corporation selected parcel would be subject to the requirements of Section 22 (g) of ANCSA. Overall, the impacts of Alternative 1 on visual resources are <i>negligible (indeterminate)</i> .	Alternative 2 would transform the landscape by introducing a road to a currently roadless area. The proposed road is expected to be compatible with the existing landscape, and the area would retain very high scenic quality. The summary impact would be <i>moderate (indeterminate)</i> .	Effects of Alternative 3 would be similar to those of Alternative 2, <i>moderate (indeterminate)</i> . Visual access to the Izembek Lagoon would be improved; however, similar benefits would likely not be realized for the Kinzarof Lagoon.	Operation of the hovercraft would introduce weak visual contrast to the surrounding landscape. Movement of the hovercraft across Cold Bay would be noticeable. Periods where the vessel was in view would be episodic and transient. The 6-day operations schedule is expected to be consistent with the landscape character of the communities of King Cove and Cold Bay, and the current use of Cold Bay. Future use of the King Cove Corporation selected parcel would be subject to the requirements of Section 22 (g) of ANCSA. Overall, the direct and indirect impacts of Alternative 4 are <i>minor (indeterminate)</i> .	<i>Minor (indeterminate)</i> effects to visual resources are expected as a result of implementation of Alternative 5. Improvement and use of the Lenard Harbor and Cold Bay docks would affect the overall landscape character of the communities of King Cove and Cold Bay. The deck of the ferry would promote access to views of Cold Bay and the surrounding landscape.
Cumulative Effects	Alternative 1 is expected to result in <i>negligible (indeterminate)</i> cumulative impacts to visual resources.	It is expected that the effects that may result with implementation of Alternative 2 would be additive to those associated with the King Cove Access Road. Alternative 2 is expected to have a <i>moderate (indeterminate)</i> contribution to cumulative effects on visual resources.	It is expected that the effects that may result with implementation of Alternative 3 would be additive to those associated with the King Cove Access Road. Alternative 3 is expected to have a <i>moderate (indeterminate)</i> contribution to cumulative effects on visual resources.	Alternative 4 is expected to result in <i>minor (indeterminate)</i> cumulative impacts to visual resources. Consistent use of the hovercraft, combined with the associated road and hovercraft terminal would improve the landscape character of the surrounding communities of Cold Bay and King Cove, and would afford additional views of Cold Bay and the surrounding landscape.	The contribution of Alternative 5 is expected to result in overall beneficial impacts to visual resources in the communities of Cold Bay and King Cove. Cumulative effects of the combined actions would be <i>minor (indeterminate)</i> .

	Alternative 1: No Action	Alternative 2: Land Exchange and Southern Road Alignment	Alternative 3: Land Exchange and Central Road Alignment	Alternative 4: Hovercraft Operations from the Northeast Terminal to Cross Wind Cove 6 days per Week	Alternative 5: Lenard Harbor Ferry with Cold Bay Dock Improvement
Wilderness					
Overall Effects	<i>Minor</i> impacts to wilderness character would result from noise, and opportunities for use of motorized vehicles on the Northeast Terminal road. The Northeast Terminal road is 0.5 miles from the wilderness boundary. As an indirect effect, the conveyance of the King Cove Corporation selected parcel would proceed.	Approximately 131 acres would be removed from the Izembek Wilderness for the road corridor that would follow a southern alignment through the isthmus between Kinzarof Lagoon and Izembek Lagoon. This would fragment approximately 7,665 acres south of the road (excluding Kinzarof Lagoon parcel), interrupting the ecological integrity of the area. An additional 49,491 acres would be added to wilderness as part of the land exchange. The parcel selected by King Cove Corporation (5,430 acres) would be retained as wilderness. The summary effect on wilderness would be <i>major (indeterminate)</i> .	Effects on Izembek Wilderness resulting from Alternative 3 would be similar to analysis presented under Alternative 2, but 152 acres would be removed from the Izembek Wilderness for the road corridor. The location of the Alternative 3 road corridor through the center of the isthmus, as opposed to the more southern alignment of Alternative 2 would fragment a larger section of wilderness lands on the south side of the corridor, approximately 11,759 acres. An additional 49,491 acres would be added to wilderness as part of the land exchange. The parcel selected by King Cove Corporation (5,430 acres) would be retained as wilderness. The summary effect on wilderness would be <i>major (indeterminate)</i> .	Hovercraft service 6 days per week would impact the opportunity for solitude and the primitive and unconfined recreation quality of the area. Visitors within the Izembek Wilderness would experience an increase in intermittent noise or visual disturbances in localized areas through the sights and sounds of vehicles traveling to the Northeast Terminal from the City of King Cove. The summary effect would be <i>minor to moderate</i> .	During the construction phase, the operation of heavy equipment, vehicles, and pile driving equipment would produce noise above ambient levels that would be audible from within Izembek Wilderness. Visitors to the Izembek Wilderness would experience increased intermittent, but persistent, disturbances in localized areas through the sights and sounds of ferry operations, reducing opportunities to experience solitude and primitive recreation within the wilderness. The overall impact to wilderness would be <i>minor</i> .

	Alternative 1: No Action	Alternative 2: Land Exchange and Southern Road Alignment	Alternative 3: Land Exchange and Central Road Alignment	Alternative 4: Hovercraft Operations from the Northeast Terminal to Cross Wind Cove 6 days per Week	Alternative 5: Lenard Harbor Ferry with Cold Bay Dock Improvement
Cumulative Effects	The operation of the King Cove Access Road from Lenard Harbor to the Northeast Terminal is estimated to begin in 2013. Portions of the road to the Northeast Terminal would also be visible from localized areas within Izembek Wilderness. Alternative 1 would have a <i>minor</i> contribution to cumulative effects on wilderness character within Izembek Wilderness.	The road corridor proposed would ultimately continue from the new King Cove Access Road, which is presently under construction from Lenard Harbor to the Northeast Terminal. The road would enable travel between the cities of King Cove and Cold Bay. Opportunities for unauthorized motorized use in Izembek Wilderness would likely increase beyond current levels. Alternative 2 would have a <i>major (indeterminate)</i> contribution to cumulative effects on wilderness character within Izembek Wilderness.	The cumulative effects of Alternative 3 would be similar to Alternative 2, <i>major (indeterminate)</i> .	Cumulative effects to wilderness character within Izembek Wilderness would be <i>moderate</i> . The construction of the road to the Northeast Terminal could potentially increase unauthorized and non-traditional motorized use within Izembek Wilderness on the east side of Cold Bay. The hovercraft operations would intensify localized noise disturbance to visitors within Izembek Wilderness.	Alternative 5 would have a <i>minor</i> contribution to cumulative effects on wilderness character within Izembek Wilderness.

2.9 Incomplete and Unavailable Information

According to the Council on Environmental Quality regulations for implementing the procedural provisions of NEPA (40 CFR Section 1502.22), if the information is essential to a reasoned choice among alternatives and the cost of gathering it is not excessive, it must be included or addressed in the EIS. The Council on Environmental Quality regulations provide direction on how to proceed with the preparation of an EIS when information is incomplete or unavailable:

If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include within the environmental impact statement: (1) a statement that such information is incomplete or unavailable; (2) a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment; (3) a summary of existing credible scientific evidence, which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment; and (4) the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For the purposes of this section, "reasonably foreseeable" includes impacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason (40 CFR 1502.22b).

Knowledge is, and always will be, incomplete regarding many aspects of the physical, biological, and social environments. However, central physical, ecological, economic, and social relationships are well established, and a substantial amount of credible information about ecosystems in the project area is known. It is important to identify incomplete or unavailable information that is relevant and consequential in the evaluation of environmental effects. In some cases, the evaluation of an impact to a resource is not sensitive to new information. In other instances, the analysis of an impact to a resource is very sensitive to even minor increments of new information. The purpose is to provide information that provides a basis for a reasoned choice, and describe its relevance in the analysis of environmental effects.

This section summarizes information that was outdated or not available for use in the analysis. The Service determined that while additional information could have added precision to the estimates or better specified relationships, new or additional information would not have changed the understanding of the relationships that formed the basis of the effects analysis presented in Chapter 4. Thus, the agency determined that sufficient information is available to make a reasoned choice among alternatives, and has identified limitations of data by resource area.

Marine-Road Link

The No Action alternative assumes that the Aleutians East Borough would implement landing craft/passenger ferry service if the land exchange is not approved, in accord with their permit for construction of the road to the Northeast Terminal. However, complete information is not available regarding the marine-road link of the No Action alternative. The marine component of

the marine-road link does not presently exist, but could be served by a landing craft/passenger ferry in the future if the land exchange is not approved (AEB 2012) (Appendix I). Additional discussion of the No Action alternative is available in Section 2.4.1 and 4.2.

The Aleutians East Borough has identified the general dimensions, passenger capacity, and type of craft they are exploring. The borough has not, however, identified the frequency of operations it would offer, the specifics on the design of a vessel, or the timeline for when a landing craft could become operational in the future. Without those specifics, the Service does not have complete data regarding the reasonably predictable actions of the Aleutians East Borough to develop this mode of transportation if the land exchange does not occur.

To analyze the No Action alternative, the Service used the general specifications for the craft provided by the borough (AEB 2012). The vessel specifications were supplemented with general information provided by manufacturers of a vessel similar to that generally described by the Aleutians East Borough. However, no information is available concerning operation plans for the landing craft/passenger ferry should it be acquired, no estimates have been made as to annual revenue or costs of operation since they would be too speculative. As a result of this approach, information was sufficient to make a reasoned comparison of alternatives.

Soils Data

A Cooperative Soil Survey produced by the U.S. Department of Agriculture, Natural Resources Conservation Service, which typically contains descriptions of soil properties and interpretations of the suitability and limitations of soils, as well as landform and surface hydrology information, has not been developed for this EIS project area. A broad-scale taxonomy was used for overall information (National Cooperative Soil Survey 1979). Further characterization of sites for habitat suitability was limited to other indicators, including site inspections and the analysis of aerial photographs.

A soil survey would have increased the precision of estimates for:

- The distribution of plants
- Wetlands determinations
- Borrow sites for use in construction projects
- Engineering parameters for road construction, including soil compaction, drainage features, and water table levels.

While relevant, the lack of precise soils data did not consequentially affect the resource impact analysis. The broad scale data were sufficient to make a reasoned comparison of alternatives.

Hydrology and Hydrologic Processes

Stream hydrology data was available for only 3 streams in the Cold Bay area, none of which are streams in the Izembek isthmus region where road construction is proposed. There is also no stream flow data available for streams on Sitkinak Island. Without detailed stream hydraulics and stream flow data, estimates and assumptions were made regarding the cross sections and other characteristics of potential stream crossings, historical floods, and fish passage requirements to provide designs with the least effect on hydrology and hydrologic processes. As a result of this approach, data were sufficient to make a reasoned comparison of alternatives.

Wetlands

National Wetland Inventory map products were not available for Izembek National Wildlife Refuge or adjacent lands. The only National Wetland Inventory products available relevant to this EIS project are for Sitkinak Island. The *Multi-Resolution Land Characteristics Consortium: National Land Cover Database (National Land Cover Database)* (USGS 2010a) was available for all the parcels involved, and it was determined to be the best data source available for comparing quantities and characteristics of wetland on the various parcels. Although this remote sensing product does not specifically delineate wetlands, the vegetative cover types indicated by the map products, along with landscape positions, were the best tools available to determine the likelihood of wetland occurrence.

The primary potential wetland manipulation associated with the project is in the alternatives that propose construction of a road corridor through the isthmus. Therefore, the isthmus is the primary location where detailed wetland delineations are necessary. Wetland assessments were conducted using aerial photography interpretation. For the areas within the Izembek National Wildlife Refuge, aerial photography (April 2009) was provided by the Service. However, because these photos were taken prior to spring green-up, their utility for delineating wetlands was limited. Aerial stereo imagery, including 1995 color and 1987 black & white coverage of the isthmus area, was obtained from AeroMetric, Inc. These aerial photos, used in combination with wetland map products produced by HDR Inc. for the 2003 EIS, were sufficient to produce wetland maps for the proposed corridor routes. For the other parcels included in a potential land exchange, general wetland information was sufficient for estimating wetland types and acreage.

Without detailed wetland delineations for all the proposed exchange parcels, the development of a numerical wetland value system (or similar wetland value system) was not possible. But, through the recognition of the important characteristics of the wetlands within the proposed road corridors, such as proximity to Izembek and Kinzarof lagoons (which experience intensive use by numerous species of waterfowl, water birds, and other wildlife), a mix of open water habitats, physical location in relation to Essential Fish Habitat, and designation as a Wetland of International Importance, a narrative comparison of the wetland values within the other parcels could be made. Understanding landscape positions, functions common to each wetland system, and with the knowledge that the exchange parcels contain undisturbed habitats with wetlands functioning at full functional capacity, descriptive modifiers of “moderate value,” “high value,” and “very high value,” could be used to make parcel comparisons. As a result of this approach, data were sufficient to make a reasoned comparison of alternatives.

Vegetation

Although some detailed vegetation descriptions are available for the Izembek National Wildlife Refuge, such as *Vascular Flora of Izembek National Wildlife Refuge, Westernmost Alaska Peninsula, Alaska*, (Talbot, Talbot, and Schofield 2006), comparable detailed information is not available for Sitkinak Island, the State parcels, or for the King Cove Corporation parcels. Therefore, similar to the wetland analysis, the National Land Cover Database (USGS 2010a), which was available for all parcels, was used for the vegetation analysis when making comparisons among the parcels. The National Land Cover Database maps were generated from low resolution raster data, making it possible to make general comparisons for the analysis. The land cover data displayed on the maps has a resolution of approximately 100 feet (30 meters). The resolution, however, was resampled to approximately 16 feet (5 meters) to convert to a more

accurate dataset for acreage calculations. As a result of this approach, data were sufficient to make a reasoned comparison of alternatives.

Land Mammals and Birds

Land mammal and bird inventories for Sitkinak Island are extremely limited. Several datasets obtained from the Service, such as for the distribution of caribou, Emperor Geese, Black Brant, and other species, did not include abundance or distribution information on the State parcels northeast of Izembek Lagoon. However, these datasets did include data for state lands around Cold Bay and adjacent corporation lands that are within national wildlife refuge boundaries. As a result, several figures appear to have a mapping error for the 2 state owned townships in the northeast portion of the EIS project area. Assumptions regarding the distribution of the species and the importance of these parcels as habitat for those species are still possible, based upon the information displayed on the adjacent refuge lands and topographic and vegetation cover features of the state owned townships. As a result of this approach, data were sufficient to make a reasoned comparison of alternatives.

Material Sites

Material sites in the proposed project area are limited, particularly on the west side of the isthmus. Extensive searches were conducted regarding the quantity, quality, and availability of existing material sites. Existing sources on the west side of the isthmus were not found to have sufficient quantity or suitable quality, and are generally not available to use for the proposed road alternatives.

Geotechnical investigations could be conducted for material sources, and sites on private land could be developed on either the east or west sides of the isthmus. It is likely additional gravel sites could be developed to the northeast of the existing gravel pit site near the Northeast Terminal, based on observations of road cut banks and probing efforts during the site visit. Existence of suitable gravel quality and quantities at these sites would have to be verified by a geotechnical investigation prior to final design for construction, if the land exchange is approved. These sites are on King Cove Corporation lands and could likely be permitted for gravel extraction if a geotechnical investigation verifies suitable quality materials. Other possible material sites could include the Lenard Harbor quarry site, which would require additional permitting, and a quarry at Sand Point owned by Shumagin Corporation. Material could also be imported to the site, using existing barge landing sites. While there are numerous potential alternatives for material sites, the physical and biological impact analysis would not be highly sensitive to changes in locations of the material sites on private land. The estimated cost of the alternatives could vary, but the cost of the road alternatives relative to other modes of transit would remain similar. As a result of this approach, data were sufficient to make a reasoned comparison of alternatives.

Socioeconomics and Environmental Justice

The Draft EIS used social data from Census 2000 and other data sets as available. Data from Census 2010 became available in 2011 and was incorporated in the Final EIS, as available. The U.S. Census Bureau did not collect income data, and therefore poverty data, in 2010. Income and poverty data were available from the American Community Survey in 2009. While data

were updated in the socioeconomic and environmental justice sections, a single data set was not available. Available data sets were used.

A large portion of the official data for King Cove fishermen groundfish and crab harvests is confidential. In addition, because of the small number of fish harvesters in the City of Cold Bay, all official landings and revenue data for that community are confidential. Also confidential are comprehensive data that show the amount and value of fish processed at the Peter Pan Seafoods plant in King Cove, data on employment at that facility, and the number of local and non-local harvesters that deliver to the plant. Information on processing activities at Peter Pan Seafoods is limited to key informant interviews with Peter Pan Seafoods' officials and other participants in the fisheries, and secondary reports and data that provide information about certain components of Peter Pan Seafoods' activities. To provide more complete information on fisheries where official data are confidential, Northern Economics developed a proprietary database—the Community Fisheries Database, as described in Section 3.3.2. The limitations, applicability, and availability of socioeconomic data are discussed in Section 3.3.2. As a result of this approach, data were sufficient to make a reasoned comparison of alternatives.

Transportation

Very general data are available for air, marine, and surface traffic and reliability. Transportation in these small communities is often not counted or recorded, or it is proprietary. Documented air traffic levels and modal reliability factors, such as frequency of delays and cancellations, are not available. However, this information is consequential and relevant in the evaluation of effects to many resources. Estimates were generated as assumptions, and rely on personal communications, the 2003 EIS, and incomplete public records. Since resources (except where noted) were not sensitive to even the highest traffic estimates, these assumptions are considered adequate to make a reasoned comparison of alternatives.

Areas of all-terrain vehicle use in previously undisturbed or prohibited areas have not been well documented. Definitive levels of illegal activity are unknown, but photographic evidence of vehicle tracks and anecdotal reports are available. It is not possible to predict the level of new activity that could be induced by the alternatives in this EIS. However, given that new access may be introduced to previously undisturbed areas in the Izembek National Wildlife Refuge and Izembek Wilderness, new intrusions would be relevant in the estimation of impacts. This element is addressed by mitigation measures identified in the Act, including construction of the barrier on each side of the road and by the enforceable mitigation plan that would be developed in conjunction with the Record of Decision. As a result of this approach, data were sufficient to make a reasoned comparison of alternatives.

Subsistence

While community baseline studies can allow a holistic look at subsistence patterns for these communities, some of these major studies are decades old (Braund 2002). More recent harvest data and subsistence use area maps for Nelson Lagoon and False Pass were provided in pre-publication versions by Dr. Reedy-Maschner (Reedy-Maschner 2012).

While some aspects of subsistence patterns are quite durable, including the seasonal cycle of harvests and the species pursued, other components may have changed, including rates of participation and harvest levels. A majority of the baseline data collected for these communities

is 10 to 20 years old and the harvest pattern for some species may have changed, particularly caribou since the hunting was closed from 2008 to 2012 due to low population numbers. Data presented in the subsistence section were gathered from unified federal and state databases reported by community, without distinguishing whether harvests occurred on state or federal land.

Subsistence data is relevant and consequential in the analysis, particularly as related to the potential road alignments. This information, while dated, is sufficient for the level of analysis required in this EIS, as opportunities for subsistence harvesting are not likely to be affected, or may be afforded increased access.

Cultural Resources

At the time of the Draft EIS, a field survey was not completed. The Service and the State Historic Preservation Office cooperated in conducting a field survey of the two proposed road alignments during August 2012. The survey identified two World War II “camps” adjacent to Outpost trail. This new field survey provided additional information; the data were sufficient to make a reasoned comparison of alternatives.

Wilderness

An evaluation of wilderness characteristics has not been completed for the proposed exchange parcels that would be designated as wilderness. Data are not available regarding the number of people viewing and experiencing existing wilderness qualities in person, or valuing it from afar. This resource category is very sensitive to introduced changes. However, additional data would not likely increase the precision of the evaluation of effects to this resource. The analysis largely focuses on changes to wilderness as part of the proposed land exchange, based on information from the existing wilderness area. As a result of this approach, data were sufficient to make a reasoned comparison of alternatives.

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